PLASTICS & MOLDED PRODUCTS

Volume 8 MAY 1932 Number 5

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OTHER PRODUCTS—
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831-14

GENERAL ELECTRIC

PLASTICS DEPARTMENT
MERIDEN, CONNECTICUT

Here's Looking at You

IF we needed any more evidence that the American people have become a nation of depressomaniacs, the apathetic and petulant reaction of the press and the business community to the Federal Reserve expansion policy officially announced and initiated last week should be sufficient.

Here is, by all odds, the most encouraging event of the past two years, the most important effort undertaken by our financial authorities to turn the deadly tide of deflation which has been destroying the basis of our business structure. Yet where its significance is not completely ignored, or its potential power disparaged, its probable success is scouted with a sort of sadistic satisfaction. One might almost believe that there are still some people in this country who would deplore business improvement either because it would be "premature" or because it would deprive them of that perverted pleasure which humans seem to take in their own sufferings, or in those of others.

The time has long since passed for sophomoric cynicism or skepticism of that sort. It would be of little use if this effort failed, and it will look silly if it succeeds. If anyone has an excuse for sardonic comment on it, it is those lone voices who for more than two years have monotonously insisted that this deflation was unnecessary and could have been stopped at any time since the summer of 1930 by such action as is being taken now—not those callous commentators who insisted that natural economic forces must take their course without artificial interference.

For our part, we are quite willing to accept all the explanations the Administration and the Reserve authorities offer for not having done it before. We do not much care whether or not they were forced into it by the bonus bill or other more drastic measures behind which desperate debtors' classes are mobilizing in order to make money cheaper. We are quite ingenuously glad that at last someone has decided that the time has come to buy the United States on the auction block at rummage sale quotations and sell it back to us again. We don't care about the price; we don't object to the substantial profit there is bound to be in the transaction. We still believe that this country will be a bargain, even at the peak prices of 1929, no matter how many times it is sold out.

All that we are interested in is that this time, after all the discouraging series of hesitations the Reserve authorities have displayed in this matter during the past two years, they will drive ahead with full determination to carry through and put their powers of compelling credit expansion to the ultimate test, in spite of all the obstacles which commercial banking psychology and foreign hysteria may offer to their efforts. For the simple fact is that this line of action, as is explained elsewhere in this issue, is the logical and inevitable next step to the measures the Administration has already taken. If it fails to start steady and rapid credit expansion through established banking channels sufficient to restore price levels, far more drastic anti-deflation medicine in the form of direct currency inflation will be unavoidable. There can be no business recovery until the scarcity of money is overcome and its value lessened, so that prices may be lifted and the burden of debts lightened.

In this the banks are no less interested than business men and workers, for they are the world's greatest debtors. On this crucial issue all classes must stand together or they will fall together; and whether or not we understand what it is all about, we would all do well to give the Federal Reserve folks a rousing cheer and wish them lots of luck.

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April 27, 1932

PLASTICS & MOLDED PRODUCTS

Reg. U. S. Pat. Off.

Volume 8 **MAY 1932** **Number 5**

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THE present bankruptcy and receivership laws are outlets for racketeers. Newspapers have been full of the Earl Radio case, but closer to home in the plastics field is that practice which enables a company to sell its product below cost for many months, disturbing the entire field, and then to convert its losses into profits through liquidation and settlement at a few cents on the dollar. The legitimate business enterprise has no protection against this evil. It must witness market demoralization, and profits to the one concern that causes it. Let us hope that a new statute will soon be enacted to clear the business world of these "depression profiteers."

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PLASTICS & MOLDED PRODUCTS

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Volume 8 MAY, 1932 Number 5

Cold Molding

New Developments in Compounds and Manufacture

By N. S. Stoddard

Plastics Department, General Electric Company

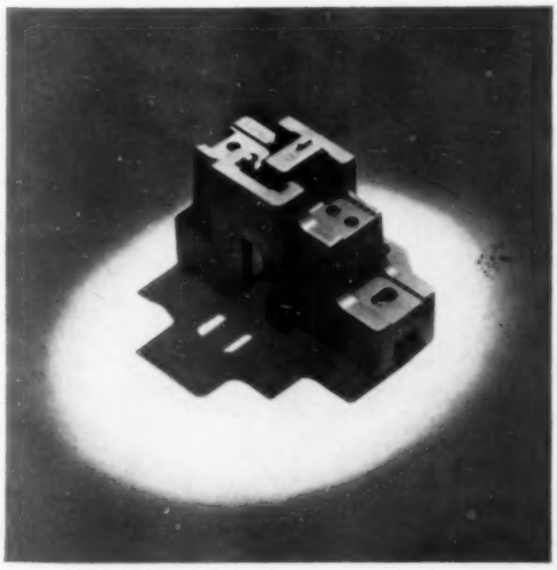
ARCHAEOLOGICAL research has proven that a plastic art in the molding of pottery was developed long before the use of even the written word. In fact, Plastics appears to have been the first accomplishment of the Dawn Man, unless perhaps the chipping of flint and quartz into tools may have preceded.

In comparison with the ages which passed between the first shaping of clay and the time when the needs of electrical industry brought a new emphasis to the development of better insulation, the period covering the modern development of Plastics is but a split second in time.

In this first development the use of natural resins and cold-molded materials was general. With the advent of the synthetic resins, the earlier materials were rapidly replaced. However, it is a matter of common history that when a new adoption tends to supersede an older art, the advantages of the older art are oftimes overlooked.

This has been the case with hot-molding of the synthetic resins. Because of certain advantages, it was applied almost universally — and to many applications where it did not belong. It is interesting that just now there is a reversal of this trend and that cold-molded designs are replacing hot-molded in that part of the field which, by virtue of its special properties, should always have belonged to cold-molded.

Since the writer is intimately familiar only with the developments within the Company with which he is connected, the subject matter is particularly applicable to the products of the General Electric Company.



A typical example of the intricate parts that can be molded from Cetec nonrefractory at a comparatively low cost with excellent insulation properties for switches and similar electrical applications.

Cold-Molded Still Useful

During the past year an intensive program of study and research has been carried on, scrutinizing every phase of cold-molded operations from the basic properties of the raw materials to the details affecting finish. This was not done because the engineers held any brief for cold-molded as such, but purely because in certain applications of vital importance, hot-molded compounds had proved unsuccessful.

In this analysis, the point of attack was on those characteristics in which cold-molded has been considered inferior. These were strength, moisture absorption, dielectric properties, accur-

ate dimensions and, in general, lack of uniformity, which led to a wide variation of properties in products from the same run.

It is interesting that all of these problems were solved by methods of chemical and physical control and by introducing new manufacturing processes, which eliminated—or, at least, minimized—the variables which had formerly been present.

Fillers and Binders

The filler for these materials is asbestos, which, like any other natural product, varies widely in its structure and impurities, largely depending on its point of origin. The binders are bituminous products and certain drying oils in the case of the non-refractory compounds and inorganic products in the refractory compounds. By means of strict specifications based on accurate knowledge of the desired basic properties, and with rigid tests of the materials when received, the variables in the raw materials are either eliminated or the necessary compensation provided.

A study of the mixing operations by which the binder and filler are compounded, produced new methods, which also led to more exact control, so that the compound embodies the desired properties when it is delivered to the press.

As in any other type of molding work, the design of the mold was found to be the vital factor affecting accuracy of dimension. Since there is a very great shrinkage—as compared to the hot-molded compounds, where the final shape is formed in the mold—in the after treatment, and since these shrinkages vary with length, width and cross section, a high degree of experience is necessary to design a mold that will produce pieces of the accuracy that is demanded by modern production assembly methods.

In view of the fact that the shrinkage of these materials in the after treatment is of the magnitude of 0.010 per inch, and because these compounds are inherently abrasive — causing much more rapid mold wear than is experienced in hot-molding—the choice of steels and the design of the mold demand the most advanced technique, plus an assurance that the compound will be itself so uniform in its characteristics that its behavior can be predicted.

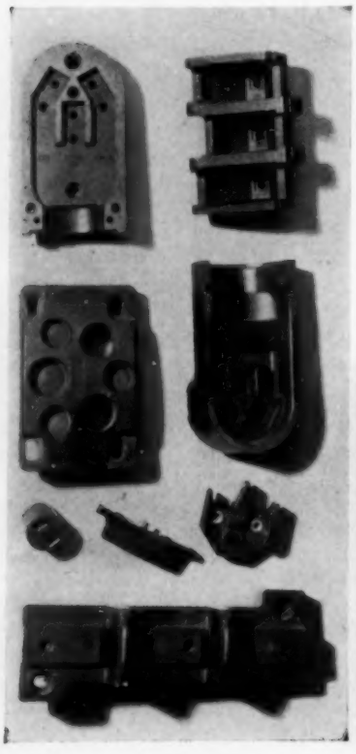
In all cold-molding, the press merely provides the necessary compression of the material, while its curing is consummated in a subsequent heat treatment, which, therefore, imparts and becomes responsible for the quality and character of the finished piece.

By the use of electric heating units and the circulation of heated air, the temperature is easily adjusted and is accurately held at the desired degree. Also, this temperature is uniform throughout the heating chamber, which had been impossible with any of the methods of heating previously used.

With the knowledge of the temperature and time required for any form or size of piece, the after treatment becomes a very exact, scientific process.

Cold-Molded Types

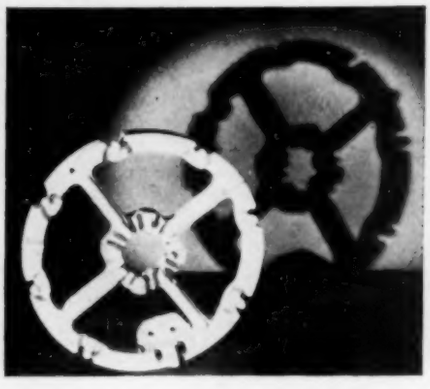
In general, there are three types of applications in the field belonging peculiarly to cold-molded: First, where the temperature will not exceed 300 degrees C. for any considerable length of time and where the exposure to arcing is relatively slight, such, for example, as breaking the current of a flat-iron or other household appliances; second, where the maxi-

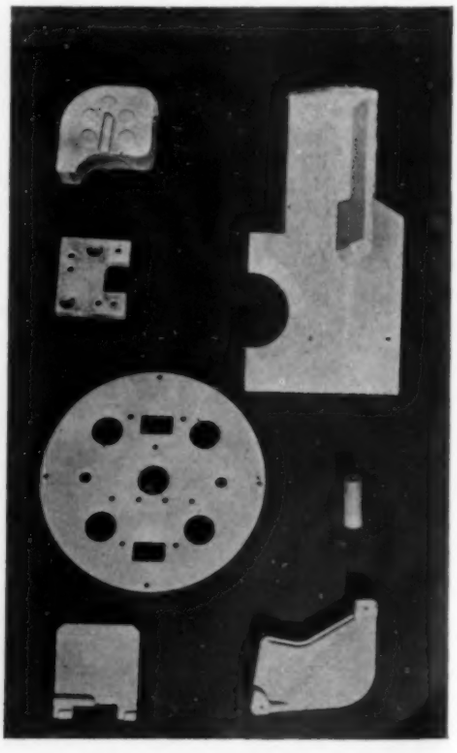


Left: These cold-molded parts are of the nonrefractory material. Dependable, strong insulators that can be cold-molded at a large saving over the use of hot-molded.

Right: A group of refractory molded pieces used as insulation against excessive arcing.

Below: This electrical unit support is Cetec cold-molded, manufactured from refractory compounds to assure high resistance to heat.





mum temperature is of the order of 230 degrees C. but the arcing may be of the real power type, such, for example, as in industrial control apparatus, which may be located in a large power station or sub-station with such a limited impedance in the lines between that, in case of fault, a vicious arc may be produced; third, where the temperature will not exceed 1,000 degrees C. for any considerable length of time and where a power arc is a possible contingency. In this case only a refractory material is suitable. Examples of applications are: arc shields, rheostat bases, heating elements, when the material directly supports a white hot element, etc., etc.

Three distinct types of compounds have been developed in these fields, of which the first two are non-refractory and the third is refractory. The non-refractory material of the first type has a transverse strength of 5,500 lbs. per square inch with Izod impact values, based on A.S.T.M. standard tests of 0.40 to 0.45. Dielectric strength averages 125 volts per mil and water absorption is less than 1.5% after forty-eight hours of total immersion.

The second type with the greater arc resistance will have the same transverse strength, but slightly better compression strength, i. e. 12,000 lbs. per square inch against 10,000 lbs. The dielectric strength is not quite as high, about 75 volts per mil against 125 volts per mil. The water absorption is the same.

Refractory Material

The refractory type has substantially the same physical strength, but is inherently more moisture absorbent. Without any surface treatment, the water absorption in forty-eight hours total immersion is 15%, but if moisture absorption is important and other requirements permit, a surface coating may be applied which will reduce the moisture absorption to about 1.5%. The dielectric strength of the refractory type is of the order of 40 to 80 volts per mil, depending on its moisture content, but it is rarely necessary to obtain high insulating values in applications involving extreme temperatures.

Although the distinctive field for cold-molded is in applications involving high temperature or exposure to arcing, it is also used on many other applications where the quantities are small.

A single-cavity cold-molding die is relatively inexpensive and its rate of production is very much higher than a single-cavity hot-mold, because of the nature of the process.

Although the specific gravity of cold-molded is approximately 50% higher than hot molded, the cost of the cold-molded compounds is so much lower that the cold-molded piece is lower in cost, except when the quantities justify the use of multi-cavity hot molds.

Wider Usefulness

It is believed that with the substantial improvements that have been made in physical and dielectric strength, resistance to shock, the ability to hold closer tolerances and the assurance of uniformity in the product, cold-molded assumes a much more important position in the Plastic field today than it has had in recent days. This cannot help being true if engineers appreciate its applicability to a large field in which it is distinctly supreme.

New Fashions in Handbag Frames and Clasps Utilize Colorful Pyralin

By F. de Francia; du Pont Style Service

THE interesting novelties in handbags now being launched in style circles here lie in the frames and clasps with which they are ornamented. There are no important changes in leathers and other materials used for the body of the bag.

The fashionable materials for frames and clasps are plastics and the colors are white, quartz pink, delicate shades of blue and jade green with a sort of marble finish. Blue, which has been sponsored by Patou, seems to be enjoying an increasing popularity. Many of the manufacturers are sponsoring imitations of tortoise shell which they think will be in demand for the end of the summer and next fall.

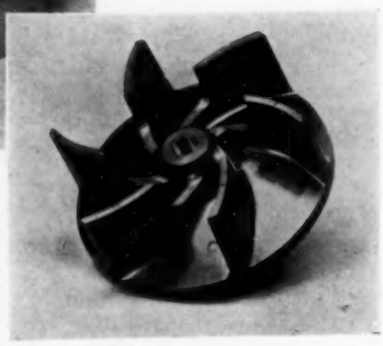
The new frames are usually straight and flat, whatever the shape of the handbag may be. Another interesting feature of the bags is the fact that buttons are used rather profusely for trimming. There are new sport and afternoon bags which have an envelope shape with the strap fastened on the bag itself with large Pyralin buttons. The button-holes are made in the same leather. These buttons are sometimes in contrasting shades on beige and brown handbags. The buttons shown are all in imitation of tortoise shell. Buttons are also lavishly spread over afternoon and evening handbags. These models are also of the envelope type and the buttons, which are very small, are grouped together forming a sort of triangle on the crepe or satin background through a diagonal line, leaving the other part of the bag perfectly plain. With this particular type of handbag the buttons used are preferably plastic or mother-of-pearl. On very elaborate models the buttons are replaced by Pyralin beads imitating precious stones and alternating with rhinestones.

Gross With Northern Blower

MR. KARL GROSS, one of the foremost authorities in the country on lead burning and homogeneous lead work, has been added to the staff of the Northern Blower Company to assist in their work on corrosion-resisting process equipment.

Better Sales and Service With a Resinoid Molded Fan

The Cinderella Washer Became Safer and Simpler When a Bakelite Fan Replaced Metal



The Bakelite molded fan in the Cinderella Clothes Washer is an application that is in keeping with the times. It reduces production costs, yields a product having greater life and service; all of which are appreciated by the manufacturer, jobber and consumer.

By J. F. Apsey, Jr.
Appliance Division
The Black & Decker Mfg. Co.

NO one part in any machine can be termed "most important". Proper operation depends on the function of each part in relation to the others. Yet in the Cinderella Clothes Washer, the resinoid molded fan does stand apart as having an unusual task to perform and does its job especially well because of its unique electrical, mechanical and chemical properties.

A feature of the Cinderella Washer is the fact that no moving agitators touch the clothes. The suction effect of a rapidly rotating fan is the only means of causing agitation in the washer. Operating at 11,000 r. p. m., the fan builds up an unequal atmospheric pressure, creating a vacuum in the inner cylinder and consequently a higher pressure in the small chamber between the inner and outer cylinders. This causes water to rise in the inner cylinder and drop in the outer one, until air has entered under the edge of the inner cylinder. This relieves the vacuum and allows the body of water to drop back as the air rushes up through it. Constant and rapid repetition of this cycle provides the mechanical agitation necessary in the washing operation, and causes air to pass through the clothes, which provides further cleansing action.

Mechanical Advantages

It can thus be said that no part, among the forty-six different pieces shown in the assembly drawing, is more important in the operation of the washer than the Bakelite molded fan. Its chief advantage, over the metal fan which it replaces, is its electrical insulating qualities. This characteristic of molded phenolic resinoids is, of course, widely known. However, in the Cinderella Washer a peculiar insulation problem arises. The suction effect of the rapidly rotating fan causes droplets of water, from the tub below, to rise and impinge upon the blades of the fan.

When the metal fan was used, this acted as a perfect conductor of current from the motor to the water, and thus to the exposed metal parts of the tub. Of course, such passage of current would only occur should the motor armature winding become grounded. However the danger of this occurring with the metal fan did exist. By using the Bakelite molded fan, which completely covers the end of the motor armature shaft, a perfect insulation is built up and the possibility of shock to the person operating the washer is totally eliminated, since the motor itself is insulated from its mounting.

Careful study was made of the mechanical strength of the molded material before the metal fan was replaced. Mechanical strength also had considerable bearing on the re-design of the part. The material must be capable of resisting the stresses developed within at the operating speed in addition to

ing. It was found that the molded material was amply strong in this respect. In fact it was found possible to secure sufficient strength with a considerably reduced weight, as compared with the metal fan. This reduced the load on the motor with an accompanying reduction in turning effort. Further, the substitution of the molded fan eliminated the noise attending the impact of water on the revolving metal blades. The washer now works in comparative silence as against the sharp metallic ring that accompanied its operation when the metal fan was standard equipment.

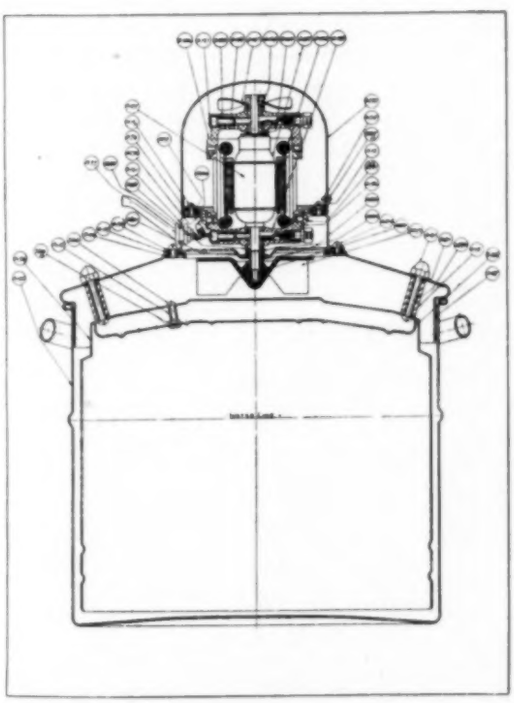
Better Balancing

Balancing the metal fan so that it would rotate truly was troublesome. An advantageous feature of the molded fan is that it comes from the press more perfectly balanced since the molding process tends to impart uniform density to the product. Thus, the time required for individual balancing on the assembly line is reduced to a minimum. This is one of a number of conditions that permitted lowering of production costs with the use of the Bakelite molded fan. With the assurance of better balance with less trouble, smoother and quieter operation of the motor is obtained. This means elimination of vibration which would have a bad effect on the motor parts and bearings.

Cleanliness

The matter of keeping the fan clean after use is simplified with the molded part. Soaps and detergents, most of which contain free alkali or develop free alkali after being dissolved, have no corrosive action on the molded fan. The metal fan could corrode and besides being weakened mechanically as it is eaten into by the chemical action, would become unbalanced as the corrosive action would not be equal all around and vibration would be introduced.

In every sense the adoption of the Bakelite molded fan has proved of benefit. In its insulating aspects it makes the washer safer and trouble-proof. It provides identical mechanical efficiency with greater economy of operation and is in step with the trend to make domestic duties simpler.



The molded fan, part A-279 in the assembly drawing, is one of forty-six parts that go into the make-up of the Cinderella Clothes Washer. But its continuous, efficient operation is essential to the proper function of the machine. The resinoid molded fan does its part effectively.

Continental-Diamond Announces New Type Laminated Plastics

LAMINATED synthetic-resin sheets, which do not incorporate the usual phenolic resin, are now being produced by the Continental-Diamond Fibre Co., Newark, Del. These "Cellanite" sheets are made by introducing the synthetic resin into the fibres before they are made into paper, which is laminated and compressed hydraulically under heat. The resultant product has high electrical and thermal insulating properties, great mechanical strength, is odorless and odor repelling, and is practically unaffected by water or oil. Furthermore, this material is not affected by alkaline solutions. Properties are as follows: Dielectric strength—800/900 volts per mil; power factor, 3; dielectric constant, 5.5; tensile strength (⅛-in. material) 12,000 to 15,000 lb. per sq. in.; transverse strength (⅛-in. material) 23,000 to 29,000 lb.; specific gravity, 1.35.

Sheets and Rods Available

For the present, Cellanite is made only in sheets and in rods turned from sheets. Sheet sizes are 38x38, 38x43 and 30x38 in. Thicknesses range from 1/32 to 4 in. Three grades are made as follows: Grade M—for mechanical, thermal and chemical applications. This grade is not used for electrical insulation, but has found use for breaker strips on refrigerator cabinets. It is odorless, odor repelling and immune to mold rot. Grade EX is for general electrical and radio insulation. Grade EXX is for electrical and radio insulation where extreme moisture resistance is important. Two colors are furnished; black and natural-brown to golden.

Toolmakers Move

MECHANICAL Die & Tool Co., formerly located at 80 Washington Street, Brooklyn, N. Y., have moved to 11 New York Avenue, N. Y. Personnel and management remain the same.

Cellulose Acetate Plasticizers

A study of film characteristics, especially flexiblity and rate of combustion, as affected by various new plasticizing agents

IN United States Patent 1,841,311, dated January 12, 1932, entitled "Cellulosic Composition of Matter Containing Butyl Propionate," the accompanying Figure 1, clearly illustrates the particular advantages of employing my novel plasticizer in the plastic arts. In this drawing there are plotted lines or curves graphically depicting the properties of film produced from a composition containing cellulose acetate and this plasticizer. On the horizontal axis is indicated the various percentages of my plasticizer that may be employed with the cellulosic acetate, this percentage being given in parts added to the cellulose acetate rather than parts of the composition; for instance, 30 parts plasticizer added to 100 parts cellulose acetate is denoted as 30% plasticizer added. On the vertical axis at (a), on the left, is indicated in percentage over the check sample the initial flexibility of a film which has been formed as described from my novel composition and which has been subjected to air at 50° C. for 24 hours to free it of solvent; the rate of combustion of that film is also indicated by this same column (a); at (b) on the right is indicated the length of time in days that the film will maintain flexibility when subjected to air kept at a temperature of 65° C.

The four patents reprinted here, in part, contain data which make a valuable contribution to the knowledge of cellulose acetate plastics. United States Patents 1,841,311; 1,841,312; 1,841,313 are by Stewart J. Carroll and United States Patent 1,844,714 is by Stewart J. Carroll and Henry B. Smith. All four patents are assigned to Eastman Kodak Co., Rochester, N. Y.

The curve (A) depicts initial flexibility of the film, the curve (B) depicts the ability of the film to maintain flexibility and the curve (C) depicts the rate of combustion of the film—all with various percentages of my novel plasticizer and all as compared to the respective properties of a film produced from a solution of cellulose acetate in acetone and a hypothetical inert material substituted for the plasticizer as denoted by curve (D) indicating unity of 100% and 30 days for (a) and (b). It will thus be noted that my novel plasticizer has the faculty of giving, to a product produced therefrom very good initial flexibility and a low combustion rate, and that the product maintains its flexibility quite well. The preferred percentage of my plasticizer which it is desirable to employ to contribute any particular property to the final product will be obvious from an inspection of this drawing; the best percentage to employ will depend upon which property it is desired to feature most in the final product.

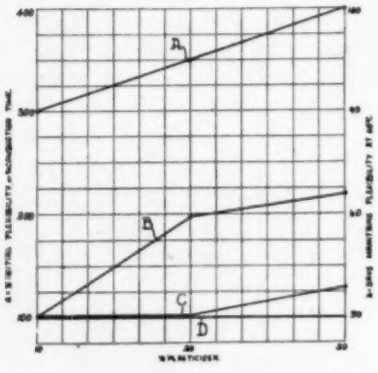


Fig. 1. Above. Curves showing flexibility and rate of combustion of cellulose acetate films with various percentages of butyl propionate.

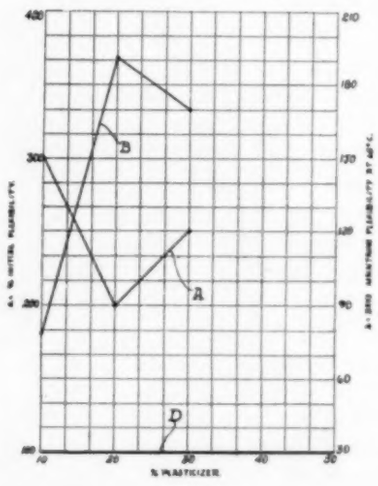


Fig. 2. Right. Curves showing flexibility and rate of combustion of cellulose acetate films with various percentages of cyclohexanol.

Cyclohexanol

"Cellulosic Composition of Matter Containing Cyclohexanol" is the title of United States Patent 1,841,312 dated January 12, 1932. The accompanying drawing, Figure 2, clearly illustrates the particular advantages of employing my novel plasticizer in the plastic arts. In this drawing there are plotted lines or curves graphically depicting the properties of film produced from a composition containing cellulose acetate and this plasticizer. On the horizontal axis is indicated the various percentages of my plasticizer that may be employed with the cellulosic acetate, this percentage being given in parts added to the cellulose acetate rather than parts of the composition; for instance, 30 parts plasticizer added to 100 parts cellulose acetate is denoted

as 30% plasticizer added. On the vertical axis at (a), on the left is indicated in percentage over the check sample the initial flexibility of a film which has been formed as described from my novel composition and which has been subjected to air at 50° C. for 24 hours to free it of solvent; at (b) on the right is indicated the length of time in days that the film will maintain flexibility when subjected to air kept at a temperature of 65° C.

The curve (A) depicts initial flexibility of the film and the curve (B) depicts the ability of the film to maintain flexibility all with various percentages of my novel plasticizer and all as compared to the respective properties of a film produced from a solution of cellulose acetate in acetone and a hypothetical inert material substituted for the plasticizer as denoted by curve (D) indicating unity of 100% and 30 days for (a) and (b). It will thus be noted that my novel plasticizer has the faculty of giving, to a product produced therefrom, very good initial flexibility and a low combustion rate, and that the product maintains its flexibility quite well. The preferred percentage of my plasticizer which it is desirable to employ to contribute any particular property to the final product will be obvious from an inspection of this drawing; the best percentage to employ will depend upon which property it is desired to feature most in the final product.

Nitro-Para-Xylene

In United States Patent 1,841,313, dated January 12, 1932, entitled "Cellulosic Composition of Matter Containing Nitro-Para-Xylene," the accompanying drawing, Figure 3, clearly illustrates the particular advantages of employing my novel plasticizer in the plastic arts. In this drawing there are plotted lines or curves graphically depicting the properties of film produced from a composition containing cellulose acetate

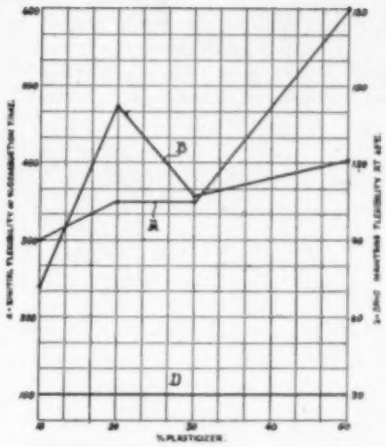
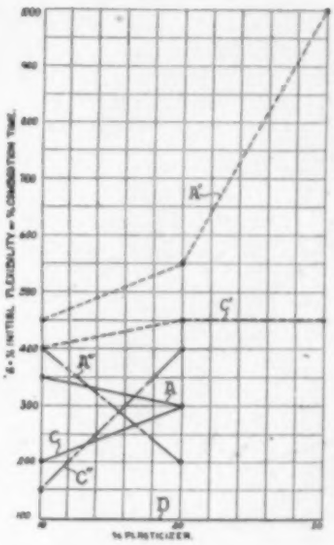


Fig. 3. Left. Curves showing flexibility and rate of combustion of cellulose acetate films with various percentages of nitro-para-xylene.

Fig. 4. Below. Curves showing flexibility and rate of combustion of cellulose acetate films with propionamide, salicylamide and succinimide.



and this plasticizer. On the horizontal axis is indicated the various percentages of my plasticizer that may be employed with the cellulosic acetate, this percentage being given in parts added to the cellulose acetate rather than parts of the composition; for instance, 30 parts of plasticizer added to 100 parts cellulose acetate is denoted as 30% plasticizer added. On the vertical axis at (a), on the left, is indicated in percentage over the check sample the initial flexibility of a film which has been formed as described from my novel composition and which has been subjected to air at 50° C. for 24 hours to free it of solvents; at (b) on the right is indicated the length of time in days that the film will maintain flexibility when subjected to air kept at a temperature of 65° C.

The curve (A) depicts initial flexibility of the film and the curve (B) depicts the ability of the film to maintain flexibility, all with various percentages of my novel plasticizer and all as compared to the respective properties of a film produced from a solution of cellulose acetate in acetone and a hypothetical inert material substituted for the plasticizer as denoted by curve (D) indicating unity of 100% and 30 days for (a) and (b). It will thus be noted that my novel plasticizer has the faculty of giving, to a product produced therefrom, very good initial flexibility and a low combustion rate, and that the product maintains its flexibility quite well. The preferred percentage of my plasticizer which it is desirable to employ to contribute any particular property to the final product will be obvious from an inspection of this drawing; the best percentage to employ will depend upon which property it is desired to feature most in the final product.

Amide Derivatives

"Cellulosic Composition of Matter Containing an Amide or Derivative Thereof" is the title of United States Patent 1,844,-714 and refers particularly to the use of propionamide, salicylamide and succinimide as plasticizers of cellulose acetate. The accompanying drawing, Figure 4, clearly illustrates the particular advantages of employing our novel plasticizers in the plastic arts. In this drawing there are plotted lines or curves graphically depicting the properties of film produced from a composition containing celllulose acetate and any of these plasticizers. On the horizontal axis is indicated the various percent-

(Continued on page 211)

Some New Applications of Synthetic Plastic Materials

The varied possibilities of plastic materials cannot be better demonstrated than by means of this group of new 1932 jobs. From hair clippers to helmets, some plastic has properties that fit it for improving an old product or makes possible a new article impracticable with older materials. These illustrations are proof of this contention.

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Topping the group at the left is the new modern Durez flower pot. Severely simple, the mottled green molded jardinieres have harmonizing trays to match. The hole in the bottom permits drainage and it is claimed that the Durez has no injurious effects on the plant . . . Second is shown a closeup of the Bakelite molded guard on the inner legs of the Leopold Desk. Leather pads on the corner of the chair make it impossible to mar desk or chair . . . . The du Pont Pyralin towel bar made its appearance in the bathroom when color came into vogue. This one is made by the Advanced Products Company. . . . There is always something new under the sun. This time it is a Bakelite molded helmet which has recently been adopted by the German police.

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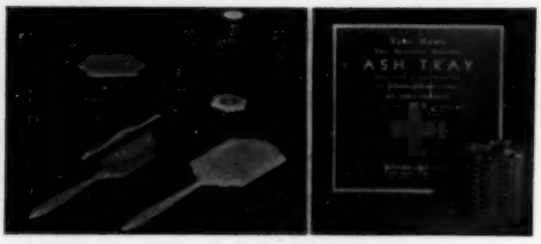
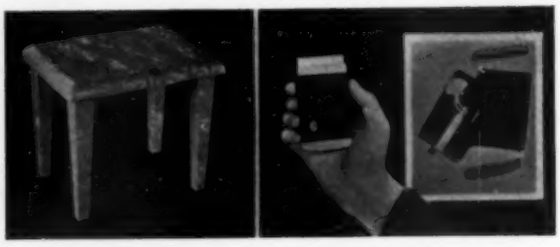


White alabaster Marblette is used in this new dressing table set made by Shoreham Manufacturing Company. The richness of the cast plastic material decidely places this set in the luxury class of boudoir accessories. Johnson & Johnson uses Bakelite molded in a novel merchandising scheme. A brilliant scarlet ash-tray is given away with a purchase of some J. & J. product. The tray thus serves a double purpose.



Du Pont pearl Pyralin is used in this bathroom stool made by M. P. Berglas Manufacturing Company. It is furnished in jade, maize and rose finishes. At the right is the "Automatik" card case with Bakelite molded material. A turn of the little wheel will eject a card clean and without fuss. The inner mechanism is of simple construction. Finished with an inlay of Morocco leather and two gold tips.

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Many products can be improved in style and design by the use of molded parts. The upper photograph on the left shows changes in the Marks Products Company's switch plugs. The first two are of cold molded composition. On the extreme right is the all Bakelite plug, their latest model. Below are shown the changes in design of the John Oster Manufacturing Company's hair clippers in the last six years. More and more resinoid material is used as the years roll on.

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It was not so many years ago that the adhesive tape replaced the rag-bound sore finger. A later refinement brought the short band with gauze attached, but a disadvantage of this type of dressing was that it absorbed moisture. Now this objection has been overcome by the use of a Bakelite backing which makes the band waterproof. Below is a box of Bakelite molded material for Stern inlay golds. The molded box bears a table of physical properties engraved on the inside of the cover.

Molds and Mold Fixtures

By W. G. Alpeter

Development Engineer

Western Electric Company

Molds should be constructed with a view to minimum construction cost and maximum operating output. Various fixtures can be employed in most molding operations which serve to expedite production. A typical example of a molding application which embodies these features is the phenol resinoid telephone mouthpiece, which serves as an example in this article.

FOR molding phenol plastic parts, it is essential that the molds be designed for the minimum construction cost consistent with proper operating conditions and in such a manner as to obtain a maximum number of cavities for any given area of platen surface of the press. In addition the molds and mold sections must be easily accessible and interchangeable for repairs. This is particularly true where floor space is at a premium and a uniformly high rate of production of molded parts is required over a long period. The simplest form of molding tool is, therefore, one in which the individual cavities are mounted in a chase or major mold on very close center to center dimensions, each cavity consisting of a complete molding unit in itself which can be readily replaced whenever necessary. The old type of hand mold meets these requirements in a general way except that it is limited in output by the size and weight that can be readily handled by the molding operator. It is, however, cumbersome at best and does not lend itself readily to the use of knock-out, insert locating and filling fixtures.

With these various conditions in mind the manufacture of the telephone mouthpiece shown in Figure 1 can be taken as an example of modern practice. This part was formerly made of a shellac mica plastic which was not entirely satisfactory because of the high replacement expense, on account of breakage in service and the fact that it could not be satisfactorily sterilized without losing both shape and lustre. It has been replaced by the more substantial phenol plastic mouthpiece which, while it has a higher initial cost, is less expensive because of its longer life. The engineering requirements are close thread dimensions, a thorough cure and a lustrous die finish.

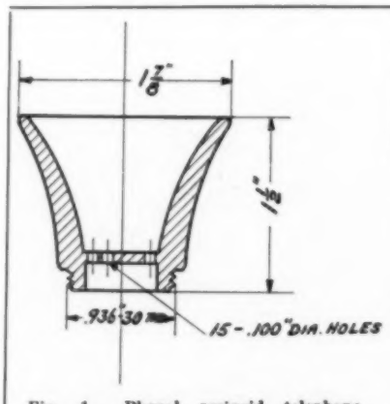

Fig. 1. Phenol resinoid telephone mouthpiece. The engineering requirements are close thread dimensions, and a thorough cure to insure high finish and requisite strength.

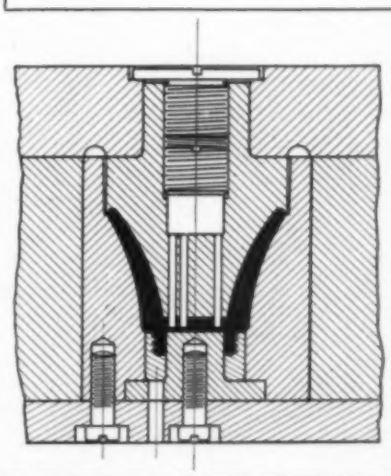

Fig. 2. Cross-section of a single mouth piece mold showing three distinct parts, the punch which forms bell mouth including grid holes, the cavity which shapes the outside, the loose insert which forms the threads.

The mouthpiece receives its form from three distinct parts in the mold, as shown in Figure 2. They are the punch, which forms the bell mouth down to and including the holes in the grid; the cavity, which imparts its contour to the outside; and the loose insert, which forms the thread. The insert is placed in the bottom of the cavity before the mold is filled, and is ejected with the mouthpiece from which it then is unscrewed. These three hardened and polished steel parts comprise the mold compartment, the complete mold consisting of forty-nine such compartments assembled in a single chase about two feet square. The punches, together with the plate to which they are attached, comprise the upper half of the mold. At the corners of this plate are located guide pins which enter openings in the lower half of the mold to insure proper alignment of the punches in the cavities when the mold is closed.

Fixtures

This grouping of a large number of compartments in a single mold permits the use of various fixtures to expedite the molding operation. An insert locating fixture, Figure 3, upon the individual plungers of which the loose inserts are applied by hand and held by spring clutches, is used to locate all of the forty-nine inserts in their respective cavities simultaneously. A load-

Fig. 3. Insert locating fixture which drops 49 inserts into respective cavities simultaneously.

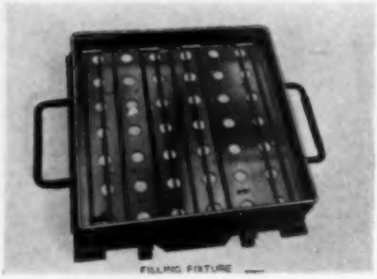

Fig. 4. Filling fixture which places necessary amount of molding compound into each cavity.

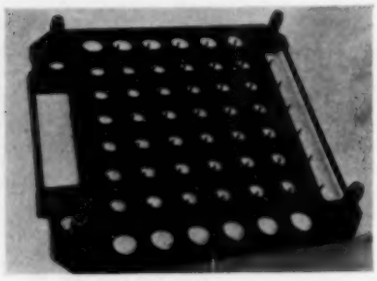

Fig. 5. Knockout fixture which lifts molded mouthpieces, together with loose inserts, from the mold.

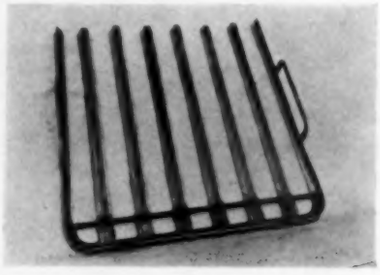

Fig. 6. Finger fixture which is used to remove ejected parts from the mold.

ing fixture, Figure 4, is used to place the necessary quantity of phenol plastic in each cavity. The upper part of this fixture is a hopper to contain a supply of the material. Beneath the hopper are arranged forty-nine cylindrical measuring chambers which are adjustable in height and are separated from it by a shutter. The bottoms of the chambers are closed by another shutter which can be opened to admit the material to the mold cavities when the loading fixture is placed in position over the mold. Projecting upward from the corners of a plate called the knock-out fixture, Figure 5, are large pins which pass through openings in the body of the mold and contact with the guide pins to lift the upper half from the body of the mold. At the same time smaller pins, of which there are three for each compartment, engage the loose inserts in the bottoms of the mold cavities and lift the inserts and the mouthpieces to which they are attached from the mold. A finger fixture, Figure 6, which is a fork having eight tines so spaced that the mouthpieces can be suspended between them, is used to remove the ejected parts from the mold.

The hydraulic press developed for manufacturing phenol plastic parts is so designed that it will advantageously handle the simplest and cheapest type of molding tool, consisting of a punch plate, a mold chase and a knock-out fixture. In fact it is hand molding with large molds placed on a machine basis. The molding equipment consists essentially of two presses in one, a press incorporating the heating station and a sub-press embodying the cooling station, with a table revolving about a central column as shown in Figure 7 to transfer the mold from one to the other.

The heating station is at the rear and consists of an upper stationary platen and a lower platen which is raised by the main hydraulic ram and lowered by hydraulic pull-backs. When the lower platen is raised it lifts the mold from the revolving table and presses it against the upper platen. Both platens are equipped with steam heating channels and heat the molds by conduction. The cooling station is of tilting head construction and is similar to the heating station except that the upper platen is attached to a tilting head equipped with hooks for lifting the upper half of the mold. The capacity of the sub-press ram is less than that of the main ram since it is used only for cooling, to close the mold, and to knock out the molded mouthpieces. The platens at the cooling station are equipped with water cooling channels. There are two sets of dies in constant use, one mold being heated while the other is being cooled, unloaded and refilled for the succeeding cycle. The time required for the operation of each station is about the same, so that the only time lost at each cycle is that consumed by rotating the table. Like in a single type press, the time cycle for this type of press must include in consecutive order heating, cooling, stripping and loading operations; but while one mold is undergoing the heating operation, the other is undergoing the three remaining operations of the mold cycle.

With this type of molding equipment the molds are not

(*Continued on page 217*)

Fig. 7. Press used in molding telephone mouthpieces. Curing position is in service, in the rear. Tilting head open for loading. Knockout fixture shown at left.

Mineral Pigments In Plastics

By N. D. Scowe

E. M. & F. Waldo, Inc.

THE use of pigments in plastics is a new field comparatively to the pigment manufacturer and consequently little has been published on this subject. We have not tried to make this an article bristling with scientific detail, but one which will be applicable to the entire plastic industry.

The first step is the setting up of specifications which will insure a uniformity of finished material. This has to be considered, not only from the plastic manufacturer's viewpoint, but from the that of the color manufacturer. The most important of these specifications are

1. Fineness and softness of texture.
2. Specific Gravity.
3. Permanence.
4. Freedom from moisture.
5. Absolute uniformity of shipments.

We shall discuss these specifications in the above order.

Fineness and Texture

We have grouped these two characteristics together though the texture of a color is an inherent quality and can hardly be changed by fine grinding. A fineness of 99% 325 mesh is the accepted standard although some manufacturers specify a fineness of 100% 200 mesh. This latter specification insures a uniformity even higher than the 99% 325 mesh as all of the material passes a 200 mesh screen while in the 99% 325 mesh, the remaining 1% may not pass a 100 mesh screen. With the advent of plastic products in the lacquer field, the finest possible grinding is desired. Not only are the finer colors more easily dispersed but they produce a much more easily applied paint or lacquer.

Some people confuse softness of texture with fine grinding, but as previously stated, this is an inherent quality of the color and can not be changed. In many natural deposits there is found a small amount of combined silica, which is very harsh and no matter how finely it is ground, it still feels gritty. This grit is very hard on machinery and in instances where large amounts of color are used, a saving in wear and tear on machinery can be effected by the use of softer colors.

Specific Gravity

The specific gravity is a specification best set by the manufacturer of synthetic plastics, hinself and, for the most part, depends upon the product to be manufactured. It is now possible, in a great many instances, to manufacture a pigment of definite shade and tint, over a comparatively wide range of specific gravities. In many cases this will be important as the specific gravity of the finished product is affected by the specific gravity of the dry color. In our opinion, this should be kept as low as possible in order to secure the best dispersion and maximum color value. In certain pigments, maximum ash contents are designated so as to insure a uniform specific gravity.

Moisture

Free moisture causes sticking and in this manner impedes a satisfactory dispersion. It can also cause trouble in the structure of the plastic itself and in the appearance of the finished product.

Permanence

This is the most desirable attribute possessed by mineral pigments. Except under extreme conditions, mineral pigments are permanent. Plastic moulding is carried out in temperatures around 150° C and under pressures varying from 1500-6000 lbs per square inch. In view of these conditions, it can easily be understood why mineral pigments give better results where permanence is a highly desirable feature, than do some of the chemical colors.

Uniformity of Shipments

This feature is totally dependent on the dry color manufacturer but its importance should not be minimized. In the past, 5% variations have been allowed and accepted. Now with close technical control and improved manufacturing facilities, it is possible to offer products of practically no variation. The color of a finished plastic product is a function of the straight (Overtone) shade and tint (Undertone) and to insure products of uniform beauty, the dry color shipments should be uniform in every respect. Not only can product be improved by buying from a source of sup-

(Continued on page 215)

One of the principal recommendations of molded plastics is that color is an inherent part of the material—and not a superficial application. Thus pigments, or other coloring agents, are an important ingredient of moldable plastics. The conditions under which pigments must stand up are far more severe in the molding process than in any other field, such as baking enamels. The properties of mineral pigments, which make towards better molding compounds are reviewed in this article.

Laminated Plastics With a Metal Base Provide New Material of Construction

Architects and builders expressed keen interest in the newly developed metal-felt composite structure. The laminated material described in U. S. Patent 1,844,512, by Gerald H. Mains, assigned to Westinghouse Electric & Mfg. Co., should prove of like importance.

AN object of my invention is to produce a laminated structure comprising one or more metallic strips having a roughened or etched surface, to which sheets or strips of fibrous material, impregnated with a suitable binder, such as a phenolic condensation product, are molded under heat and pressure to form a composite article.

Another and more specific object of my invention is to provide an improved method of uniting laminated sheet material to strips or sheets of metal which comprises treating the metal with a suitable roughening agent, such as a sand blast, to produce an indented or uneven surface, immersing the sheet or strip in a pickling bath to clean and further etch the material, rinsing and drying the metal to produce a clean surface and finally molding fibrous sheet material, impregnated with a suitable binder, such as a phenolic condensation product, upon the roughened surface, under heat and pressure, to form a composite article.

Preparation of Metal

It has heretofore been proposed to mold metallic sheets or strips into laminated products for the purpose of reenforcing the material and increasing its strength. Difficulty, however, has been experienced in securing a strong joint between the fibrous sheet material and the metallic member and this is especially true when the structure is made from comparatively thin sheets of material.

I have made the discovery that, if the metal is roughened or etched in a suitable manner, strips or sheets of fibrous material, impregnated with a binder that is capable of being hardened under heat and pressure, may be securely united to the faces of the metal sheets to form a strong unitary structure.

My invention may be utilized in various applications. For instance, it is particularly valuable in aeroplane construction, where maximum strength and stiffness for a minimum weight is required. It may also be utilized in structural elements, such as panels, angles, channels, tubes, or the like, or it may be employed in providing protective or decorative covers for the surfaces of containers.

My invention will be better understood by reference to the acompanying drawings, in which Fig. 1 is a perspective view of a metallic sheet that has been roughened on one face and a plurality of sheets of fabric material that have been impregnated with a phenolic condensation product. Fig. 2 is a cross sectional view of a molded laminated structure showing the fibrous material molded to the roughened face of the metallic sheet.

Fig. 3 is a similar view of a laminated structure showing a sheet of metal roughened on both faces and fibrous material

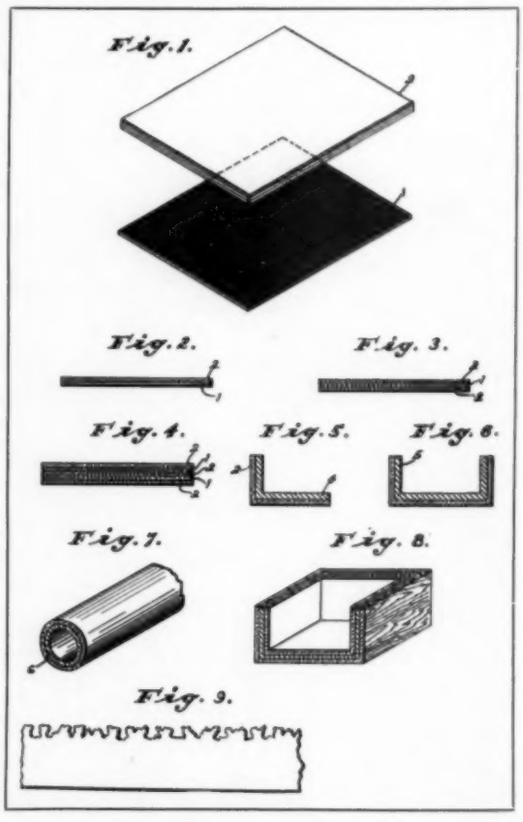

Figure 1 in the illustration shows the roughened metal sheet and a number of sheets resin-impregnated fabric. Figure 2 to 8 show various forms of composite material, the fabric anchored to one or both sides of the metal. Figure 9 is an exaggerated side view of a metallic sheet showing etched undercuts which grip the fabric.

molded thereto. Fig. 4 is a cross sectional view of a molded laminated structure showing alternate layers of metal having roughened surfaces on both sides and alternate layers of fibrous sheet material molded to the metal.

Figs. 5 and 6 are cross sectional views of structural elements having a roughened surface to which fibrous sheet material has been molded. Figs. 7 and 8 are perspective views, respectively, partially in cross section, of a pipe and a container made in a similar manner; and Fig. 9 is an exaggerated side view of a metallic sheet that has been roughened by a sand blast and etched with an acid.

In practicing my invention, the metal sheet or strip 1 is first roughened by any suitable means, such as a sand blast. The sand or grit employed for this treatment may vary considerably in size but I prefer to utilize material that will pass through a screen having 20 to 40 meshes per square inch. The material is next immersed in a dilute acid bath. An ordinary pickling bath, such as a dilute solution of sulphuric or nitric acid, is suitable for this purpose. The plate is then rinsed in water and permitted to dry. This treatment forms an irregular etched surface that is partially sulphated or oxidized.

Preparation of Fabric

The fibrous sheet material is prepared by the usual process which consists in first impregnating the sheets with a suitable binder, such as phenolic condensation product, and then drying the sheets at a sufficient temperature to eliminate the solvent without hardening the binder. A plurality of sheets of the impregnated fibrous material is then placed on one or both sides of the metallic sheet and the layers consolidated, under heat and pressure, into a unitary, composite structure.

A pressure of 500 pounds to 2,000 pounds per square inch and a temperature of 100° C. to 180° C. are suitable. The heat causes the binder to flow, and the pressure forces the fibrous material into the indented and etched portions of the plates. The partially sulphated or oxidized surface also increases the adhesion between the fibrous sheet material and the metal.

Upon the application of continued heat and pressure, the binder is solidified to form a composite structure that is strong and rigid. My improved process is particularly valuable for aeroplane structure because composite elements or plates that are comparatively thin in cross section and have greater strength than the molded material and greater rigidity than metal of the same weight may be produced. The fibrous material also protects the metal from corrosion and permits the formation of decorative effects.

Variety of Shapes

Referring to Figs. 1, 2 and 3 of the drawings, the numeral 1 designates a metal sheet that has been roughened and etched in preparation for the molding process and the numeral 2 the consolidated layers of fibrous material. As shown in Fig. 2, the fibrous material is molded to only one side of the metal sheet 1. In such structures, it is of course only necessary to roughen or etch one side of the metallic sheet but, when laminated structures are desired having fibrous material on both sides of the metal, as shown in Figs. 3 and 4, the metal will be roughened or etched on both sides. In Figs. 5, 6, 7 and 8 of the drawings, examples are given which illustrate various articles that may be constructed in accordance with my improved process. Figs. 5, 6 and 7 respectively show an angle iron 4, a channel 5 and a pipe or tube 6, having fibrous material molded on the outside, and Fig. 8 illustrates a container having molded material on both inner and outer surfaces.

Since the method of producing a roughened surface may be accomplished by various means, I do not desire to be limited in this respect. For instance, heavy metal rollers having suitable projections may be utilized for scoring, roughening or undercutting the surface of the metal, or other suitable mechanical means may be employed, such as a heavy wire brush. I prefer, however, to utilize the sand-blast treatment for roughening the surface of the metal and to further etch it by means of a suitable acid bath. The sand-blast treatment is economical and has the tendency to undercut the surface of the metal as shown in Fig. 9 of the drawings. The roughened portions are then further etched by means of acid. An undercut roughened surface has a particular advantage because the fibrous material has a greater co-efficient of contraction than the metal and, during the cooling of the composite plate in the molding process, it will, accordingly, be securely anchored in the indentations formed on the surface of the metal.

Metal Pickling Bath

The pickling bath to be utilized will depend upon the metal employed as the reenforcing element. For example, when a ferrous metal, such as iron or steel, is employed, the standard sulphuric-acid pickling bath is very satisfactory. When copper is utilized, a pickling bath comprising a mixture of sulphuric and nitric acids gives good results. For etching aluminum or aluminum alloys, I prefer to utilize an aqueous solution of hydrochloric acid as the etching agent. A pickling bath, such as sulphuric or nitric acid, is preferred when it is capable of etching the particular metal desired because these baths have the tendency to produce a partially oxidized or sulphated surface which increases the adhesion between the metallic sheet and the fibrous material during the molding operations.

While I have described my invention in considerable detail, it will be understood that I do not desire to be limited to the

exact process and structure disclosed. For example, the moldable material may consist of fibrous sheet material or it may consist of agglomerated material, such as chopped, punched or shredded cloth, duck, paper or other fibrous material, that has been impregnated with a suitable binder, such as a phenolic condensation product.

Among nine claims are:—

1. The method of forming a laminated structure comprising a layer of metal and a layer of fibrous material which comprises treating the layer of metal to form an indented surface, impregnating the fibrous material with a binder capable of being hardened under heat and pressure, assembling the layers and subjecting the assembled structure to sufficient heat and pressure to force a portion of the fibrous material into said indentations and to harden the binder, thereby securely anchoring the layer of fibrous material to the layer of metal

2. The method of forming a laminated structure comprising a layer of metal and a plurality of layers of fibrous material impregnated with a fusible binder capable of being hardened when heated, which comprises treating the layer of metal to form indented surfaces on both sides, assembling the fibrous material on each side of the layer of metal and molding the assembled layers, under heat and pressure, to form a composite structure, sufficient heat and pressure being applied to force the fibrous material into the indentations and to harden the binder, thereby securely anchoring the fibres to the indentations.

New Resin and Plasticizer is Developed for Nitrocellulose Products

DEVELOPMENT of a new liquid resin to be known under the name of Abalyn is announced by the Naval Stores Department of the Hercules Powder Company.

The new product is a resinous plasticizer for nitrocellulose lacquers and other products. The properties of Abalyn indicate that it will find a wide application in the manufacture of such products as clear interior lacquers for metal and wood, alkali-proof lacquers, leather lacquers, coatings for fabric and paper, non-drying inks, rubber cements, adhesives, waterproofing compositions, transparent paper and similar products.

The new liquid resin, which was developed at the Hercules Research & Experimental Laboratories, has already been given many practical field tests and will be marketed from the Wilmington office of the Hercules Powder Company.

Abalyn is a pale yellow viscous resin that has a solvent action on nitrocellulose in the presence of alcohols. It has in addition, according to reports from the Hercules Naval Stores Department, the following properties:

Properties

It is not appreciably affected by alkalies or weak acids and does not hydrolyze with boiling water. It has a faint, mild and ester-like odor. It is compatible with all the normal non-volatile and volatile ingredients of nitrocellulose lacquers.

It is insoluble in water and is an excellent waterproofing and impregnating agent. It is a substantially non-drying product although it oxidizes very slowly to a pale yellow resin. It has a solvent action on practically all natural and synthetic resins, rubber, and drying oils.

It is not corrosive and does not liver with basic pigments. It serves as both resin and plasticizer and may be used to impart gloss, adhesion and body in nitrocellulose lacquers, that normally contain no resins, without loss of flexibility.

Tariff Commission Orders Study of Laminated Sheets

THE United States Tariff Commission, Sidney Morgan, Secretary, has ordered an investigation of laminated sheet stock under the provisions and for the purposes of Section 336 of the Tariff Act of 1930 to be held in Washington, D. C., on May 27th, 1932. The formal order reads as follows:

Laminated Products

Notice is here given, pursuant to Section 336 of the tariff act of 1930, that a public hearing in the foregoing investigation will be held at the office of the United States Tariff Commission in Washington, D. C., at 10:00 o'clock a. m. on the 27th day of May, 1932, at which time and place all parties interested will be given opportunity to be present, to produce evidence, and to be heard with regard to the differences in costs of production of, and all other facts and conditions enumerated in Section 336 of the tariff act of 1930 with respect to, the following articles described in paragraph 1539 (b) of Title I of said tariff act, namely, "Laminated products of which a synthetic resin or resin-like substance is the chief binding agent, in sheets or plates."

Notice of this hearing shall be given by posting a copy thereof for thirty days prior to said 27th day of May, 1932, at the office of the Commission in the City of Washington, D. C., and at the office of the Commission at the Port of New York.

Watson-Stillman Appoints Chicago Representative

THE Watson-Stillman Company of Roselle, New Jersey, builders of hydraulic machinery and accessories, on April 1st appointed The Spalding Machinery Company, Inc., located in the Engineering Building, 205 West Wacker Drive, Chicago, Illinois, to be its Sales Representative in the Chicago Territory.

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QUALITIES WHICH GIVE YOU:

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WHEN you use Eastman Cellulose Acetate, you need never allow for production tie-ups due to physical impurities. Nor do you have to expect a certain percentage of return shipments on account of fading colors or other evidence of chemical instability.

Back of the quantity production of Eastman Cellulose Acetate stands the most modern equipment for physical and chemical testing. Constant vigilance and care continually guard its high quality.

From the selection of the cotton linter to the testing of the finished material, every step in the manufacture of Eastman Cellulose Acetate assures chemical and physical purity. Even microscopic impurities would make it unsuitable for photographic film manufacture—one of the largest uses to which it is put.

So, if cellulose acetate can be used in your process, standardize on this Eastman material. It is available in sheets, dry form, or solutions with a wide range of viscosities. Write today for further information.

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Chemical Sales Department Rochester, New York

And the List Keeps Growing!

Hundreds of contributors have written hundreds of articles for the readers of *Plastics & Molded Products.* And as each new issue appears, new names come forward with new information for an ever-growing circle of readers. Here is a partial list of contributors, leaders of thought and action in the plastics industry, who have written for *Plastics & Molded Products* in recent years.

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Plastics & Molded Products has been an authoritative source of information for laboratory research workers, production executives and sales directors. Many publications, from nationally circulated journals to privately-distributed house organs, have quoted from *Plastics* when discussing this growing industry. Following are some of the classifications of editorial interest:

Technical Information
Progressive New Methods
Molding & Molders
Laboratory Analysis
Technical Abstracts
Business & Trade News
New Products & Uses
New Materials
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I. C. I. Introduces New Plastics at the British Industries Fair

By A. C. Blackall
British Correspondent

THE Imperial Chemical Industries combine introduced two new plastics at the recent British Industries Fair. The first is benzyl cellulose which is being manufactured in Great Britain for the first time and the other, Novite H. S., a special grade of phenolic resinoid.

Benzyl cellulose, by reason of its thermoplasticity and stability, is particularly suitable as a base for the preparation of molding powders. Such molding powders are stated to show no signs of decomposition on prolonged storage. The thermoplasticity of the material, which melts at about 180° C., but softens at lower temperatures, endows the molding materials with remarkable flowing properties. Consequently they are particularly suitable for injection molding. They are free from volatile materials, no solvent is used in their manufacture, and the products therefore do not warp. Molding is carried out at temperatures of 120-160° C. For straight molding, it is stated, a pressure of one-half ton per square inch is sufficient, while for injection molding the normal pressures and equipments are used. No curing or hardening process is necessary. There is also an important advantage in that all scrap may be re-used. The finished material may be produced in transparent and translucent forms. Cups made from it were shown at the Fair which had a perfect porcelain glaze, and it would be practically impossible for an expert to tell that they were not china without touching them.

Novite molding powders, made from a phenol formaldehyde resin mixed with a wood flour filler, were also featured by the chemical combine. The surface finish, dispersion and permanence of colors against light and acids in Novite powders is claimed to be superior to any other competitive phenol formaldehyde powder. In light-colored powders such as red Novite, this superiority is most marked, and for red storage battery knobs where resistance to acids is essential, this powder is unequalled.

Electrical Properties

A special quality of Novite—H. S.—has been produced to meet the requirements of the electrical industry where moldings of high dielectric strength and resistance are essential. The effect of the method by which dielectric strength determina-

Array of plastic products featured by Imperial Chemical Industries, giant British chemical combine, at the London exposition of the recent British Industries Fair. Benzyl cellulose and Novite H. S. products were shown for the first time.

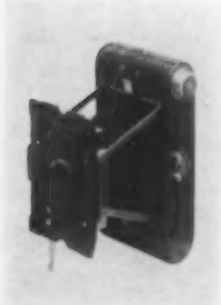
●

Bakelite Ltd., displayed the 'material of infinite uses' at this stand at the London Section of the Fair. Packaging, domestic utensils, clock cases and telephone equipment were featured applications. A similar exhibit was held at the Birmingham Section.

One of the specimen rooms at the Birmingham section of the fair equipped with modern furniture throughout. Bakelite laminated was used.

●

Wood and metal were replaced in this Hawkeye camera by molded products by Solidite and Synthetic Moldings, Ltd. Introduced at the London Section of the Fair.



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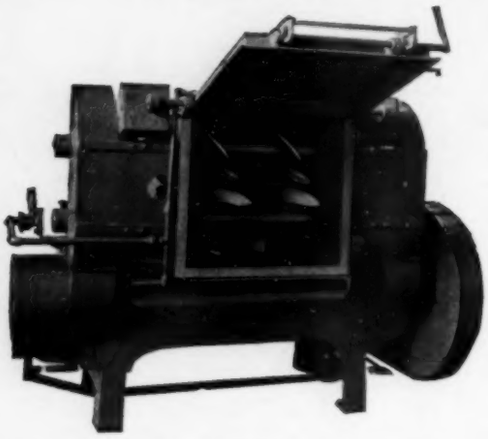

Through us you can tap a vast fund of information and helpful suggestions on any problem of mixing and kneading, dry blending, pulping and shredding, dissolving, colloiding, or dispersing involved in the manufacture of any product in the Plastics Industries—a fund gathered over a period of more than half a century in every industrial country of the world.

From us you can obtain machines designed and built expressly to meet the exacting requirements of your particular product—machines that operate with the highest efficiency, with remarkably low maintenance cost, and that will last a lifetime.

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tions are carried out has a tremendous influence on the actual value obtained, and it is only possible to make comparison under identical conditions with other dielectrics. The method employed by the makers is that recommended by the British Electrical Industry Research Association, in which the use of flat electrodes is recommended. The value obtained with black Novite when tested under these conditions at 20° C., is 13.3 kilovolts per mm., whereas the best figure obtained with other phenol formaldehyde powders is 12.4 kilovolts per mm.

Specific insulation resistance, however, is not dependent upon its method of determination and therefore the following figures obtained with black Novite H. S. at 20° C., will demonstrate their high results as compared to other phenol formaldehyde powders:—

	Before immersion in water, Ohms per cm³.	After immersion in water, Ohms per cm³
Surface resistivity	9.5×10^{13}	4.5×10^{10}
Volume resistivity	2.3×10^{13}	1.7×10^{13}

The negligible ash content and entire absence of magnesium oxide in Novite powders are important advantages for their use in the electrical industry.

Scrap Important Pyroxylin Export in 1931.

PYROXYLIN scrap, celluloid film base, and film scrap were the most important pyroxylin products exported from the United States during 1931. Recent export figures follow:

	1930 Pounds	1930 Value
Synthetic resin sheets, plates and manufactures	.....	$ 173,644
Pyroxylin products — Scrap, celluloid film base, and film scrap	.....	.....
Sheets, rods and tubes	5,330,266	2,399,027
Manufactures	634,708	838,594
Nitro or aceto-cellulose solutions, collodion, etc.	1,827,882	520,083
	1931	
Synthetic resin sheets, plates and manufactures	.....	$ 191,155
Pyroxylin products — Scrap, celluloid film base, and film scrap	2,977,602	1,477,186
Sheets, rods and tubes	860,481	677,467
Manufactures	220,730	430,172
Nitro or aceto-cellulose solutions, collodion, etc.	2,200,215	535,636

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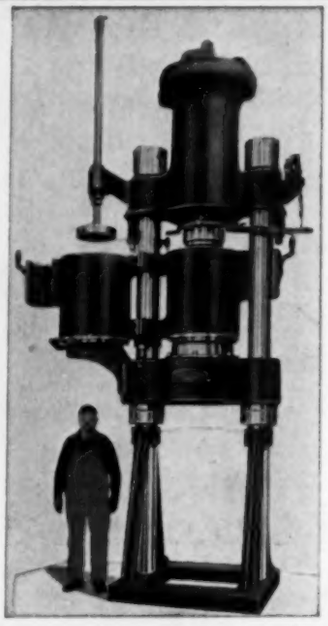

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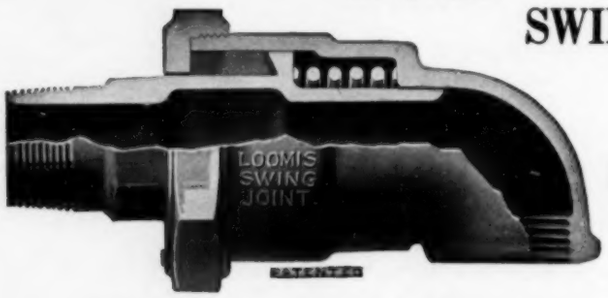

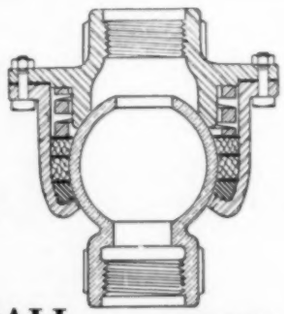

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United States Imports of Plastic Materials

SINCE June 18, 1930, United States imports of certain plastic materials have been shown in considerable detail.

The growth of interest in cellulose acetate, both the powder and semi-finished stock, is reflected in the increased imports in both these materials. Importation of cellulose acetate powder increased one hundred fold in 1931 over 1930 and in spite of the present tariff, importation of cellulose acetate plastic solids increased two and one half times in 1931 over the previous year. Casein plastics also showed an increase of almost 100% in 1931.

The table below details imports for consumption of synthetic resins, casein plastics, and compounds of cellulose, not including finished partly finished articles, with a 1931 value totaling $312,2?3.

	June 18-Dec. 31, 1930		Year 1931	
	Pounds	Value	Pounds	Value
Synthetic phenolic resins	27,023	$6,006	6,074	$6,180
Synthetic resin products laminated:				
Sheets or plates	.....	.....	.....	.....
Rods, tubes and other forms	35	58	215	612
Synthetic gums or resins, n. s. p. f. (noncoal tar)	755	345	453	173
Casein solids, galalith, etc. in blocks, sheets and other forms, not in finished articles	3,215	2,413	12,060	4,371
Collodion and other liquid solutions of pyroxylin, of other cellulose esters or ethers, or cellulose	5,103	6,951	1,626	1,827
Collodion emulsion	1,343	2,058	2,354	4,560
Cellulose products n. e. s. (not in finished or partly finished articles)				
Cellulose acetate and compounds				
Powder or flakes	120	96	24,870	22,995
Waste	.....	.....	.....	.....
Blocks, sheets and other forms	4,811	6,681	23,564	22,379
Other cellulose compounds—Transparent sheets 3/1,000 to 32/1,000 inch thick	55,934	37,421	61,944	46,105
Sheets n e. s.	(		(23,702	16,671
Rods	(94,086	104,491	(9,481	9,400
Tubes	(		(68,186	79,995
Other forms	(		(24,665	75,772
Cellulose sheets, bands, strips more than 1 inch wide, less than 3/1,000 inch thick (except cellulose acetate)	273,905	121,611	38,726	21,253

Cellulose Acetate Plasticizers

(*Continued from page 197*)

ages of our plasticizers that may be employed with the cellulosic derivative, this percentage being given in parts added to the cellulose derivative rather than parts of the composition; for instance, 30 parts plasticizer added to 100 parts cellulose acetate is denoted as 30% plasticizer added. On the vertical axis at (a), on the left, indicated in percentage over the check sample the initial flexibility of a film which has been formed as described from my novel composition and which has been subjected to air at 50° for 24 hours to free it of solvent; the rate of combustion of that film is also indicated by this same column (a).

The curve (A) depicts initial flexibility of the film and the curve (C) depicts the rate of combustion of the film—all with various percentages of our novel plasticizer and all as compared to the respective properties of a film produced from a solution of cellulose acetate in acetone and a hypothetical inert material substituted for the plasticizer as denoted by curve (D) indicating unity of 100% and 30 days for (a) and (b). The curves designated A and C refer to a film containing salicylamide, the curves designated A′ and C′ refer to a film containing propionamide, and the curves designated A″ and C″ refer to a film containing succinimide. It will thus be noted that our novel plasticizers have the faculty of giving, to a product produced therefrom exceptionally good initial flexibility and a very low combustion rate, and that the product maintains its flexibility quite well. The preferred percentage of our plasticizers which it is desirable to employ to contribute any particular property to the final product will be obvious from an inspection of this drawing; the best percentage to employ will depend upon which property it is desired to feature most in the final product.

International Combustion Tar and Chemical Sold

INTERNATIONAL Combustion Tar & Chemical Corp., one of the largest coal tar concerns in the world and manufacturers of Indur, phenolic resinoid, has been sold to P. C. Reilly, president of the Republic Creosoting Co. of Indianapolis. The International company was a subsidiary to the International Combustion Engineering Corp. and operates plants in Newark, N. J.; Chicago; Granite City, Mo.; Dover, Ohio; Chattanooga, Tenn., and Fairmount, W. Va. It has been in receivership since the spring of 1930, but has continued in active operation. The purchase price was not revealed. The purchase was negotiated by Mr. Reilly alone and the Republic Creosoting Co. has no concern with it.

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Arnold E. Pitcher,

President of DuPont Viscoloid Company

From Salesman to Chief Executive, Mr. Pitcher has grown with Pyralin in more than two decades

ARNOLD E. Pitcher, for the past three years Executive Vice President of the Du Pont Viscoloid Company, has been elected President of the corporation to succeed C. K. Davis who recently resigned to become President of the Roessler & Hasslacher Chemical Company.

Mr. Pitcher goes to his new position after a service of 23 years which began with the old Arlington Company, manufacturers of Pyralin. Born in South Waldoboro, Maine, on June 27th, 1884, he remained in this small country town for the first ten years of his life and then moved to Brockton, where he attended the public schools. He started his business career as a clerk and then as a salesman in the shoe manufacturing industry in which he remained for five years. In 1910 Mr. Pitcher entered the Arlington organization in the capacity of salesman to handle Pyralin products in their various forms in the states of Ohio and Indiana with headquarters in Cleveland. His service in that field brought him promotion and he was made District Sales Manager of the Chicago office. Later, after the Arlington Co. had been purchased by the du Pont interests in 1915 and reorganized into what is now known as the Du Pont Viscoloid Company, Mr. Pitcher was transferred to executive headquarters at Wilmington as Assistant Director of Sales, when the sales were handled from that city. After a service of two years in this capacity, he was made Director of Sales. He acted as Director of Sales for seven years, and in March 1920 was made Vice President of the Du Pont Viscoloid Company. In June of that year he was appointed Executive Vice President, which position he has filled up to the time of his elevation to the presidency.

Mr. Pitcher's service with the Company has been coincident with its great expansion in recent years and the entrance of its products into many new fields.

He is especially well known in all those branches of commerce using Pyralin and plastic materials. His many years of service in the sales end of the organization have brought him into close contact with all of the important users of Du Pont Viscoloid products.

Pickering Re-elected President of Farrel-Birmingham Co.

NELSON W. PICKERING, who was recently re-elected president of the Farrel-Birmingham Company, Inc., Ansonia, Conn., has been identified with that company and its predecessor, the Farrel Foundry & Machine Company, during all of his civilian business career.

During the World War he was associated with Franklin Farrel, Jr., now Chairman of the Farrel-Birmingham Board of Directors, who, recognizing his executive and administrative abilities, induced him to resign from the Navy and join the Farrel Foundry & Machine Company.

Mr. Pickering is well known in the trade served by the Farrel-Birmingham Company,

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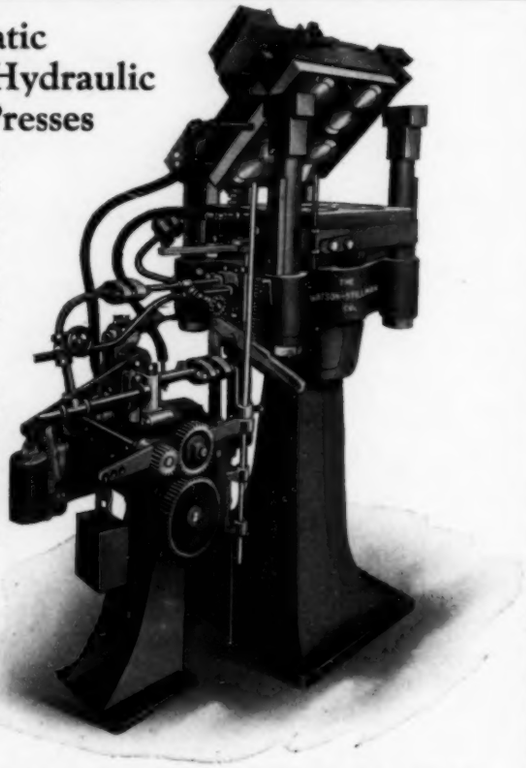

Here is a type of molding press that was primarily designed for phonograph records.

It is, however, adaptable to a wide range of other flat or shallow work.

It is equipped with a timing device which automatically controls the heating, chilling and pressure time and opens top platen at end of the cycle.

Its short stroke and rapid action make for economy in its operation. This is but one of the many types of presses for plastic molding built by

THE WATSON-STILLMAN CO.

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having traveled extensively in the company's interests throughout the United States, Canada and Europe. He recently completed a trip to a number of European countries, including Russia, where he spent several weeks observing the Soviet's industrialization program. He met many prominent figures in the Soviet government and made many contacts which enabled him to view the Russian scene from angles not permitted to all visitors in that country.

Court Postpones Sale of Kurz-Kasch Company

DAYTON, O., April 29: (By special wire to *Plastics & Molded Products.*) For several reasons which the court deemed good and sufficient, the Kurz-Kasch Co. was not sold here to-day when the time expired for opening the bids called for by attorney for the receiver.

It was disclosed that for the first four weeks of the firm's operation under receiver Walter Davidson, the Kurz-Kasch Co. showed a substantial profit. No figures were divulged but it was told to the court that the firm continued to make new accounts, retain its old ones and generally operate in a highly satisfactory manner.

There was one bid received. It was offered through an intermediary, the name of the bidder not being made public. Because the court believes that other and better bids will be received, the sale was continued until May 31, 1932, when bids will again be opened by the attorneys for the receiver.

It was shown that while there were no additions to the personnel of the Kurz-Kasch Co., there were virtually no cuts, and that its sale of Beetleware and Bakelite commodities have been greater than was expected during the past month.

A group of Daytonians, composed of stockholders and shareholders of the company, told the court that they were not ready to offer their proposal and that fact weighed considerably in the court's decision to continue the sale.

The growing belief that, since the concern has shown such powers of recovery, as attested by its earnings, some means of taking it out of its difficulties other than through its sale, may be found, was strengthened when the financial statement was shown to the court.

It must be remembered that the court ordered the business sold only as a going concern and the hopes that the Kurz-Kasch Co. will work out of its own difficulties are becoming more sanguine on the part of those closest to its business pulse. Robert F. Young, attorney for the receiver, expressed some disappointment over the fact that only a single bid was received, but said that the unanticipated resumption of such genuine soundness of the firm was sufficient reconciliation to that fact.

A Permanent Synthetic Blackboard

A GLASS blackboard has recently been developed and offered to the trade under the name of Seloc Antiseptic Glass blackboard, by the New York Silicate Book Slate Company, 20 Vesey St., New York City. This board combines the virtues of the best slate with original and exclusive properties of its own. The board is a deep black and will not fade or wear smooth. It has a velvety surface, free from imperfections.

Uniform Wear

The manufacturers guarantee the product against the defect of wearing smooth which has developed in glass blackboards in the past. They can make this offer because their blackboard is uniform in composition throughout. It is made under U. S. patent and consists of black plate glass with a suspended abrasive uniformly dispersed throughout the glass while molten. The dispersion of abrasive through the glass provides that, as the blackboard wears over a period of many years, the new surface will always contain the same amount of abrasive as did the original surface. Experimental tests equivalent to 100 years wear have left the sample in as good condition as when new. This disadvantage of sand blasted plate glass, which has been found to be a very satisfactory blackboard when new but which wears out, has thus been overcome. The black color of the board is permanent so that once erected the board will not fade and will never require treatment to restore the original color.

Pigments in Plastics

(*Continued from page 201*)

ply which makes absolutely uniform deliveries, but much valuable time can be saved in the laboratory as reformulation will be unnecessary.

The mineral colors most commonly used are umbers, siennas, red oxides, metallic browns,

MARBLETTE

On April 10th we added another unit to our plant for the purpose of taking care of increased business. We have implicit faith in the future of the Plastic Industry.

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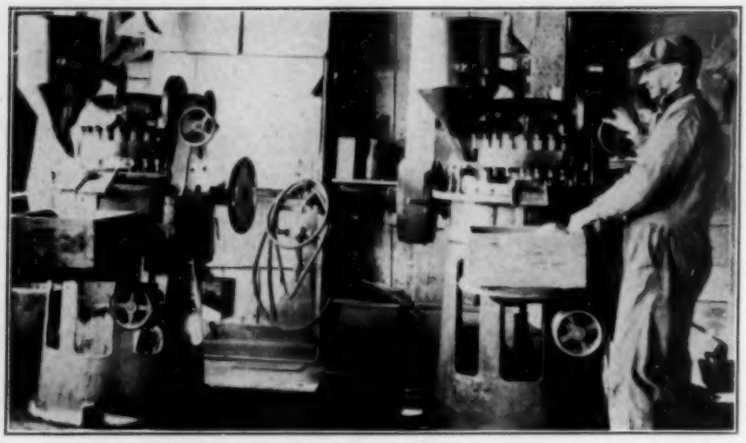

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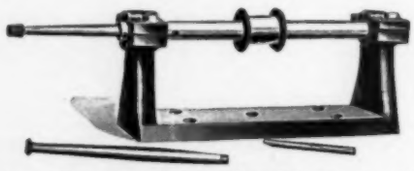

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chromium oxide and black oxides. These materials are comparatively low priced, are permanent, and in many instances increase the tensile strength of the product. Mineral pigments of low staining power, however, decrease the mechanical strength of the finished product. Some of this can be avoided by using colors of the maximum coloring power. Some manufacturers blend several colors together to obtain a certain shade; this should be left to the dry color manufacturer as he is equipped to do this in such a manner that there will be a saving in the finished product. With his machinery he can blend the component colors together so that maximum strength will be obtained and the additional cost of this blending will be found to be much cheaper to the plastic manufacture than trying to mix the colors with the rest of the raw materials.

Pastel Colors

The use of mineral colors for the production of pastel shades is limited due to the comparatively small range of shade. Those shades, which are suitable, are permanent to a high degree; and in products where permanence is a desired feature, mineral pigments should be used. As a rule, both mineral and chemical colors are used in fairly small proportion for pastel shades, the amounts used naturally being determined by the strength or staining power of the coloring medium. Certain large manufacturers have been unable to produce uniformity in permanent pastel shades with either class of colors. This is generally due to the fact that the resin itself changes color but the trouble is also experienced with chemical colors which change under the high temperatures and pressures. Mineral pigments do not fade at these temperatures.

Due to the secrecy which inevitably cloaks the operations of a new industry where expensive pioneering has been done, it is

at this time somewhat difficult to classify results and recommendations. It is believed, however, that as the plastic industry develops, more and more minds will be given opportunity to meet and work on its detailed problems. Even in connection with Earth and Mineral Colors there are important chemical and physical factors to be considered.

Molds and Fixtures

(*Continued from page 200*)

subjected to the sudden excessive temperature changes found when direct heating and cooling are used. Furthermore they need not be provided with expensive channeling for steam and water but are merely set in place on locating pins without piping connections so that they may be quickly removed. Formerly pipe connections to the molds had to be removed to make changes or repairs and the application of direct heating and cooling shortened the life of the molds. The press design permits the use of independent stations for heating and cooling, thus reducing the leaks, saving maintenance and keeping water and steam consumption to a minimum even flow. The latter is a very important item and is often the cause of considerable trouble to the molding shop with the channel type molds where a large number of presses may be in synchronism causing excessive peak loads on the steam plant. In addition the old difficulty of keeping tight joints where the same channels are used for steam and water is eliminated.

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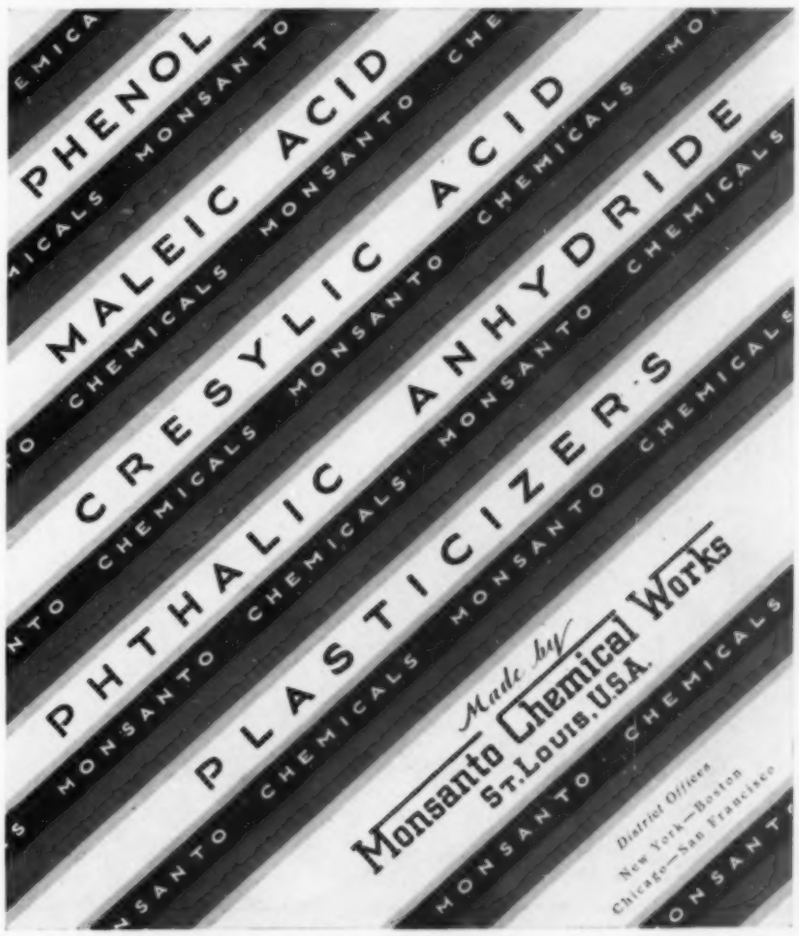

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Fig. 1

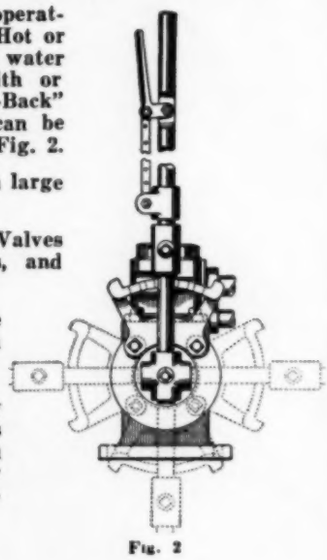

Fig. 2

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TECHNICAL ABSTRACT SECTION

A Review of Literature and Patents

Method For Producing Resin Acid Esters. Alan C. Johnston, Assignor to Hercules Powder Company. U. S. P. 1,840,395; Jan. 12, 1932.

The method of preparing an ester of a natural resin acid which includes heating a resin acid with an aliphatic alcohol in the presence of a sulfonic acid.

The method of preparing an ester of a resin acid which includes heating under pressure rosin with an aliphatic alcohol in the presence of a sulfonic acid.

The method of preparing an ester of a natural resin acid which includes heating a resin acid with an aliphatic alcohol in the presence of para-toluene sulfonic acid.

The method of producing the butyl ester of a natural resin acid which includes heating a resin acid with butyl alcohol in the presence of para-toluene sulfonic acid.

Process For The Production of Cellulose Acetate Free From Haze. Carl J. Malm, Assignor to Eastman Kodak Company, of Rochester, New York. U. S. P. 1,840,404; Jan. 12, 1932.

Fifty parts by weight of cellulose, say cotton linters which have been purified in the usual way, are mixed with 490 parts of glacial acetic acid containing 3½ parts of a mixed catalyst. The latter is composed of 2 6/10ths part by weight of phosphoric acid (95 per cent strength) and 9/10ths parts of sulphuric acid (98 per cent strength). The pre-treatment mass thus obtained is kept at 38 degrees centigrade for approximately four hours. At the end of this pre-treatment the mass is lowered to a temperature of 15 degrees centigrade and 165 parts by weight of 85 per cent acetic anhydride is added. The temperature of the reaction is allowed to rise but not at any time above 42 degrees centigrade and after a period of approximately eight to fifteen hours a cellulose acetate is obtained which is chloroform soluble.

The hereinbefore described pre-treatment and acetylation processes will not produce an entirely clear dope when the reactions are conducted in the usual commercial apparatus. If they are conducted, however, in a vessel composed of approximately 18% chromium, 8% nickel and 74% iron, with, of course, some impurities such, for example, as silicon, carbon, manganese, sulphur, etc., and in which any stirrers, paddles, rods or pipes or other implements contacting with the pre-treatment and acetylation mixtures are composed of the same alloy, a cellulose acetate dope free from haze will result. The subsequent hydrolysis of the cellulose acetate from chloroform to acetone solubility, or to any other solubility which it is desired to produce should likewise be conducted in a vessel and with implements composed of the above described alloy or its equivalent, in order that a cellulose acetate which is entirely free from haze and which is therefore particularly suitable for many commercial purposes and for the manufacture of photographic film especially may be produced.

Paratoluene Sulphonamide-furfural Resin and Process of Making the Same. William Henry Moss and Blanche Babette White, Assignors to Celanese Corporation of America. U. S. P. 1,840,596; Jan. 12, 1932.

Equimolecular proportions of paratoluene sulfonamid and furfural, together with 3% of an alkaline catalyst such as soda ash are heated together under reflux at 150° C. for eight (8) hours. A resin is obtained, which is washed with water to remove excess reactants and catalysts, is then freed from water by distillation or by drying in the air. The resin is soluble in acetone and alcohol, and largely insoluble in benzene. The toluene sulfonamid that is employed may be a pure product having a melting point of 137° C., or it may be a commercial product having a lower melting point.

The furfural may be employed in the practically anhydrous form in which it is usually sold, or it may be diluted with water. While equimolecular proportions of the reactants are preferred, the proportions used may be varied considerably. The product obtained has a melting point of 95 to 100° C.

Paratoluene Sulphonamide-Benzaldehyde Resin and Process of Making the Same. William Henry Moss and Blanche Babette White, Assignors to Celanese Corporation of America. U. S. P. 1,840,597; Jan. 12, 1932.

Equimolecular proportions of paratoluene sulfonamid and benzaldehyde heated together under reflux for 8 hours at 150° C. A resin is obtained, which is washed with water to remove excess reactants, and is then freed from water by distillation or by drying in the air. Catalysts, neutral, acid or alkaline may be added as desired. The resin is soluble in acetone and alcohol, and largely insoluble in benzene. The toluene sulfonamid that is employed may be a pure product having a melting point of 137°, or it may be a commercial product having a lower melting point. The benzaldehyde may be a pure product or a commercial one. While equimolecular proportions are preferred, the proportions used may be varied considerably.

Process of Preparing Cellulose Ethers. George W. Miles, of Boston, Mass. Assignor to Celanese Corporation of America. U. S. P. 1,841,335; Jan 12, 1932.

5 kilograms of cotton linters are treated with 60 litres of diethyl sulfate and 2 kilograms of sodium carbonate. The mixture is permitted to stand over night at a temperature of about 45° C. after which it is cooled and 25 litres of 50% aqueous caustic soda solution are added. The mixture is placed in a vessel having a water jacket and the temperature is maintained at 40° C. for about 12 hours and an ether is produced that is almost completely soluble in benzene and alcohol.

Ultra-Violet Transparent Plastic Article and Process of Making The Same. Adolph Zimmerli, of New Brunswick, N. J., Assignor to Acetol Products, Inc. U. S. P. 1,842,640; Jan. 26, 1932.

As an article of manufacture the combination with a reticular metallic base material of, a flexible film formed by evaporation of a thin solution of a cellulose ester and a plasticizer, each of said constituents being adapted to pass ultraviolet light in the region most beneficial biologically, and the plasticizer being adapted to perform the following functions with respect to the film: (a) impart elasticity thereto and (b) cause the film to wet the strands of the base and follow the expansion and contraction thereof; whereby said film has sufficient durability to give a commercially satisfactory life when the article is used as a glass substitute.

Preparation of Thermoplastic Sheets. Leo H. Baekeland, of Yonkers, N. Y., Assignor to Bakelite Corp., of New York, N. Y. U. S. P. 1,842,647; Jan. 26, 1932.

Process of preparing a substantially dry fibrous sheet containing a synthetic resin in reactive form which comprises preparing an aqueous suspension of fiber and reactive resin, continuously laying the mixture into a sheet and draining excess water therefrom, dehydrating a current of gas, and passing said current of heated dehydrated gas over at least one surface of the moving sheet, the gas current being directed upon the middle portion thereof at a rate and a temperature such that the temperature of the sheet remains below that at which excessive softening of the contained resin occurs whereby residual moisture is rapidly removed without substantially injuring the reacting properties of the resin or modifying its plasticity, and whereby the drying of the sheet proceeds from the middle outwardly.

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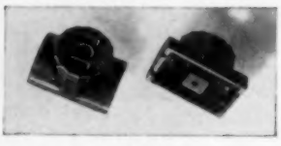

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Pyroxylin Coating Composition For Fibrous Materials. Francis B. Morton, of Parlin, N. J., Assignors to E. I. Du Pont De Nemours & Co., of Wilmington, Del. A Corporation of Delaware. U. S. P. 1,842,-978; Jan. 26, 1932.

A coating composition containing cellulose nitrate, a plasticizer, and one of the following group of oils in an amount sufficient to render the composition adherent to leather and to provide a finish free from tackiness which can be ironed and glazed, the said group of oils consisting of neat's-foot oil, cod liver oil, sperm oil, lard oil, olive oil, egg oil, and a mixture of cocoanut and paraffin oils.

Nitrocellulose-Containing Antifouling Coating Composition. Donald B. Bradner, Assignor to E. I. Du Pont De Nemours & Company, of Wilmington, Del. U. S. P. 1,843,-010; Jan. 26, 1932.

An article coated with a composition containing a water-soluble toxicant, a cellulose ester, and a gum, the ester and the gum being in proportions such that the coating will be permeable to water to a degree sufficient to permit of the leaching out of the toxicant.

A coating composition comprising a water soluble toxicant, a cellulosic film-forming material, a softener, and a gum, the cellulosic film-forming material and the softener on the one hand, and the gum on the other hand, being in such relative proportions that the composition when applied to a surface will give a coating permeable to water to a degree sufficient to permit water to leach out the soluble toxicant.

Manufacture of Compositions and Articles From Cellulose Derivatives. Camille Dreyfus, William McC. Cameron, and George Schneider, Assignors to Celanese Corporation of America. U. S. P. 1,843,214; Feb. 2, 1932.

A composition for the manufacture of molded articles, comprising 75 to 100 parts cellulose acetate, 10 parts para-toluol-sulphonimide, 13 parts para-toluol-sulphonamide, 10 parts diethyl phthalate, 10 parts rosin, and about 160 parts filling material.

A composition for the manufacture of molded articles comprising 75 to 100 parts cellulose acetate, 10 parts para-toluol-sulphonimide, 13 parts para-toluol-sulphonamide, 10 parts diethyl phthalate, 10 parts rosin, about 160 parts filling material, and a volatile liquid.

Artificial Leather Fabrication. Wallace B. Van Arsdel, Assignor to Brown Company, of Berlin, N. H. U. S. P. 1,843,349; Feb. 2, 1932.

A method which comprises finishing and embossing a porous, rubber-impregnated web of interfelted cellulose fibers, bonding it as a surface ply with one or more other porous, rubber-impregnated webs of interfelted cellulose fibers, and cutting into innersoles.

An artificial leather product com-

prising a plurality of rubber-impregnated plies of cellulose fibers, including a relatively thin surface ply, said surface ply only being finished and embossed and having greater compactness than the rest of the product.

Glyceride Resin and Process of Producing Same. Carleton Ellis, of Montclair, N. J., Assignor to Ellis-Foster Company. U. S. P. 1,843,869; Feb. 2, 1932.

A synthetic resin is made by heating, with continuous mechanical agitation, a mixture of window-glass rosin 1340 parts by weight, phthalic anhydride 308 parts and glycerol 348 parts. The temperature is gradually raised to 290° C. This can be done in the course of an hour or two with small batches but with larger quantities a considerably longer period is required. Tests may be made from time to time to determine the acid number. When it has fallen to about 10 or to a figure between say 10 and 20 the resin may be cooled to 200° C. and allowed to cool. This resin is very soluble in benzol and in the usual nitrocellulose mixed solvents. It is notably compatible with nitrocellulose and the usual softening agents. While this resin is slightly brittle its hardness compares favorably with dammar resin. The color is fairly light and it is quite resistant to water.

Solvents for Derivatives of Cellulose. William Henry Moss, Assignor to Celanese Corporation of America. U. S. P. 1,844,365; Feb. 9, 1932.

An instance of the excellent solvent properties of a mixture of methylene chloride and ethylene glycol or its ethers, it is pointed out that a solution of cellulose acetate in methylene chloride and mono ethyl ether of ethylene glycol gave viscosities and clarities measured in certain arbitrary units of 4.1 and 31.5 respectively, while the same concentration of cellulose acetate in acetone gave corresponding values of 2.8 and 8.

Example

	Parts
Cellulose acetate	20
Methylene chloride	60
Mono ethyl ether of ethylene glycol	40

Ornamental Coating and Process of Making Same. Azariah Y. Pearl, Assignor to Laboratoires Sevigne-Pearl, Inc., of Windsor, Vermont. U. S. P. 1,844,479; Feb. 9, 1932.

A process which comprises coating paper with a volatile solvent solution of nitrocellulose and salicylic acid, evaporating the solvent present in the coating to cause a setting of the nitrocellulose and a crystallization of the salicylic acid therein, and then immersing the coated paper in an aqueous alkaline solution to dissolve crystallized salicylic acid from the coating.

Molded Container Closure or Bottle Cap. William F. Schmalz, Assignor to Colt's Patent Fire Arms Manufacturing Co., of Hartford,

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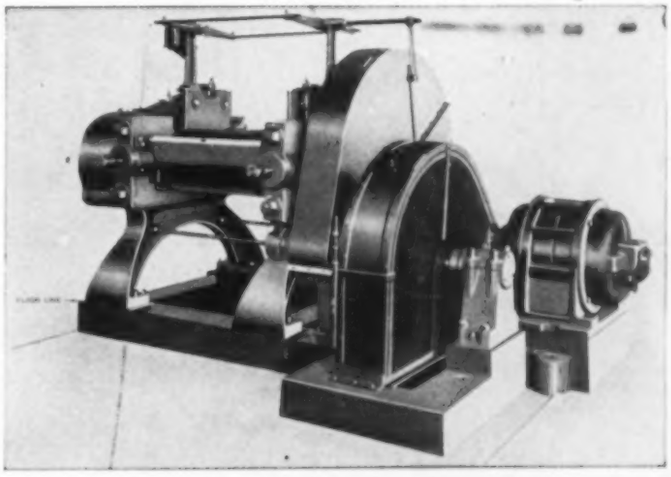

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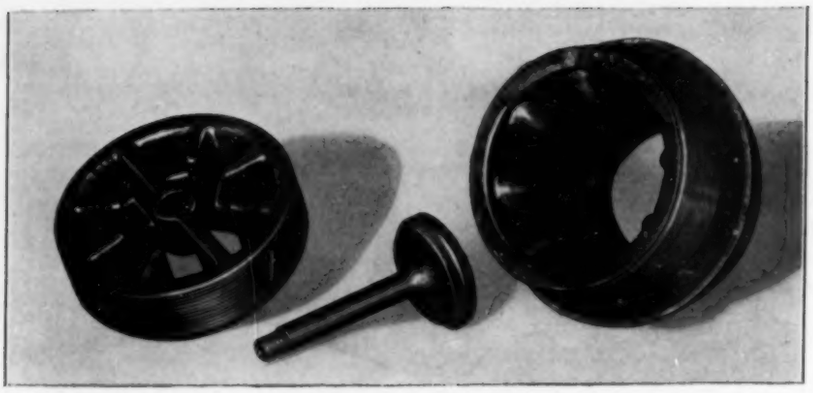

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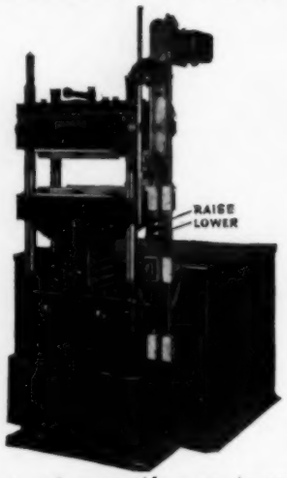

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Conn. U. S. P. 1,844,442; Feb. 9, 1932.

A container closure of the cap type molded from plastic material and having internal container engaging threads of substantially uniform pitch diameter and having above and immediately adjacent the said threads a shallow interior liner recess with a flat top and with a diameter at least as small as the minimum diameter between the tops of the threads, the said recess being provided immediately adjacent the container engaging threads and along its entire periphery with a plurality of separate circumferentially extending overlapping inward projecting liner engaging ribs, the said ribs being discontinuous from the said threads and being positioned to engage the liner at circumferentially spaced portions of the periphery thereof and to thereby hold the liner in place and prevent the passage of liquid around the edges of the liner.

Urea-Formaldehyde Resin and Process of Making the Same With Inorganic Acid Catalyst. Hans Goldschmidt, Deceased, By Marie Isolina Goldschmidt, Administratrix, and Oskar Neuss, Assignors to Synthetic Plastics Company, Inc., of New York, N. Y. U. S. P. 1,844,570; Feb. 9, 1932.

20 grams of urea are dissolved in 60 grams of formaldehyde of about 30 per cent. strength and the solution diluted with about 20 grams of water. The mixture is then heated until it foams, whereupon 5 grams of nitric acid (sp. gr. 1.4) are added. The mixture upon cooling sets to form hard bodies. The reaction is a strongly exothermic one depending on the reactive conditions, such as the manner of heating, the character of the vessel and the quantities used. Further, the heat given off by the reaction may be of such an amount that further heating will not be required.

Process of Producing Oil Soluble Phenol Aldehyde Condensation Products. Fritz Seebach, Assignor to Bakelite G. m. b. H., of Berlin-Charlottenburg, Germany. U. S. P. 1,844,824; Feb. 9, 1932.

Example

100 kilos of a phenol aldehyde condensation product.

40 kilos of β-naphthol,

0.5 kilo of hydrated oxide of manganese, are molten at 140-150° C. for 10 minutes and, the main reaction being completed, molten with 50-60 kilos of colophony at the same temperature.

Process For Reclaiming Dyed Film Scrap, Etc., Including Bleaching. Charles E. Allen, Assignor to Eastman Kodak Co., of Rochester, N. Y. U. S. P. 1,844,712; Feb. 9, 1932.

The process of bleaching photographic film scrap base which comprises treating the film scrap base with an aqueous solution of an alkaline hypochlorite through which is bubbled carbon dioxide.

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Urea-Formaldehyde Resin and Process of Making the Same In the Presence of Phenol and An Inorganic Acid. Hans Goldschmidt, Deceased, By Marie Isolina Goldschmidt, Administratrix, and Oskar Neuss, Assignors to Synthetic Plastics Company, Inc., of New York, N. Y. U. S. P. 1,844,571; Feb. 9, 1932.

10 grams of phenol are admixed with 94 grams of 30 per cent formaldehyde and 0.096 gram of concentrated sulphuric acid. The admixture is heated to boiling, whereupon 20 grams of urea are added and heating continued until the reaction mass becomes syrupy. There results a cloudy, compact mixture from which after cooling the water may be removed by pressure.

Process For the Manufacture of Cellulose Acetate. Cyril J. Staud and James T. Fuess, Assignors to Eastman Kodak Co., of Rochester, N. Y. U. S. P. 1,844,718; Feb. 9, 1932.

The process of simultaneous bleaching and acetylation of cellulose acetate which comprises pretreating the cellulose with a solution of acetic acid to which has been added a perborate dissolved in water, adding acetic anhydride and a mixed catalyst.

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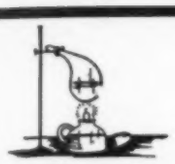

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And Now, In Closing:

THE month's business activity has centered around the New England plants . . although New Jersey and Central and Lower New York are still on the up grade . . . the rest of the country is terribly spotty . . . As for new plastic items:—many new closure and container applications in the better class trade, but not in chain stores . . . Woolworth does introduce some new items, however, such as molded urea flush-plates and complicated multi-outlets . . . also acetate candle-stick bases . . . We understand that next month they will carry a line of non-breakable children's dishes . . . not urea . . . Anderson, of Sandy Hook, bought the bulk of the old Manchester equipment . . . meaning that a part of his production will soon be hot . . . W. L. Kelley, of Chicago, has been in Hot Springs; Ed. Bachner will soon go there for three weeks . . . Segal, President of Consolidated Film (American Record), gave a talk on plastics before the Scranton Rotary Club . . . and speaking of Scranton, Lou Sylvester is back there acting as Receiver for the Graff Furnace Corporation . . . H. C. Abbott is now in charge of sales for Columbia Phonograph . . . H. E. Ward (Chicago) is President . . . Frank Shaw is on the road to recovery after a bad time with tonsils . . . The economies of depression are forcing molders to introduce new lines . . . to "pioneer for profit". . . but there is much more caution in the selection of items . . . The N. Y. Trust Company's INDEX, mentioned last month, is out . . . write us for this survey of "The Plastics Industry" . . . A machinery company's realignment will have a bearing on a new molder set-up in the East . . . All eyes have been on Dayton these last thirty days . . . Eyes, and the thoughts of friends . . .

IN the ordinary course of events, we would never feel obligated to make a statement of this nature. This, we are sure, is an exception. It is our duty to those we cannot reach personally, to talk to them plainly through this page, which they may rightly regard as being as personal as a talk.

We have been informed that two or three individuals in and around the publishing business have represented that there is, or would be, some "hook-up" between PLASTICS and their publications. They have traded on this in their talks with possible clients for their services and, in general, have claimed to know more about our business than we know ourselves. They have fabricated, elaborated and distorted until they have exhausted the intricacies of their own inventive abilities; and while many have listened, very few have withheld these contacts from us. The majority have come to us for the denial we are now transmitting to the minority.

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The Publishers.

"AND yet you incessantly stand on your head.
Do you think, at your age, it is right?"

—Alice in Wonderland.

If you do, then glance at the April issue of *Modern Packaging*. They picture two new additions to the Houbigant line, and their description for the first is a properly proportioned 'head'. The second article is a beautiful bowl for holding Shaving Cream, perhaps inspired by Yardley. In the caption, however, we note that it is a "phenol resinoid", and, continuing: "Molded of Plaskon, a new material recently placed on the market by the Mack Molding Company, Wayne, New Jersey."

This may be due either to lack of publicity or to **smart** publicity. The office boy suggests, however, that it is only careless editing. So you see, Carroll's Young Man was right!

THE above quotation might be run by F. P. A. in his Conning Tower of the New York *Herald-Tribune*. He would, we are sure, head it "Industrial Candor":—in fact he recently ran the following under that heading:

"One would indeed be bold if he attempted to predict the future growth of this Industry."

THIS Industry needs an up-to-date handbook on compounds, molding methods and mold design and construction. The most authoritative work at present available is sadly out of date, and it bases most of its conclusions on a study of cold molded products, which is too narrow a field for such a work to-day. We understand that, for some time past, Louis Rahm has been engaged in writing a really modern work, and we sincerely hope his efforts will prove successful. Others should follow his example while the need continues to be acute.